the OIL AND GAS JOURNAL

Get a load of this

...FOR LONG ROPE SERVICE IN THE OIL FIELDS

When it's time to switch the wire line, be ready with another tough B & B rope designed for that particular job. Preformed Yellow Strand Rotary Lines have the stamina to cope with quick starts and stops, high speeds, heavy strings. In the same way Brodril Cable Tool Drilling Lines have the pronounced resiliency and stout abrasion-resistance needed for reaching deep pay zones. You can count on corresponding endurance in other B & B lines. To get a load of assistance specify Preformed Yellow Strand.

Broderick & Bascom Rope Co., St. Louis 15, Mo.

BRODERICK & BASCOM
Yellow Strand
PREFORMED WIRE ROPE

Houston Factory and Branch:
9350 Market Street Road
Los Angeles Branch:
2441 Hunter Street
San Francisco Branch:
899 Bryant Street
The Continental Supply Co.
Mid-Continent Distributors
Stores in All Active Fields
The McJunkin Supply Co.
Charleston, West Virginia

PRICE 50 CENTS TABLE OF CONTENTS PAGE 59 **MARCH 10, 1952**

For Single, Dual, or Triple Completion

Nordstrom is the Valve

A fine example of modern tree design is on this dual completion well near Bosco, La. Like so many other trees, for all pressures, in oil fields the world over, it's fitted with Nordstrom Hypreseal Christmas tree valves. There's a Nordstrom valve to fit every Christmas tree design. A new Nordstrom Christmas tree bulletin, No. V-209, describes them. Write for your copy.

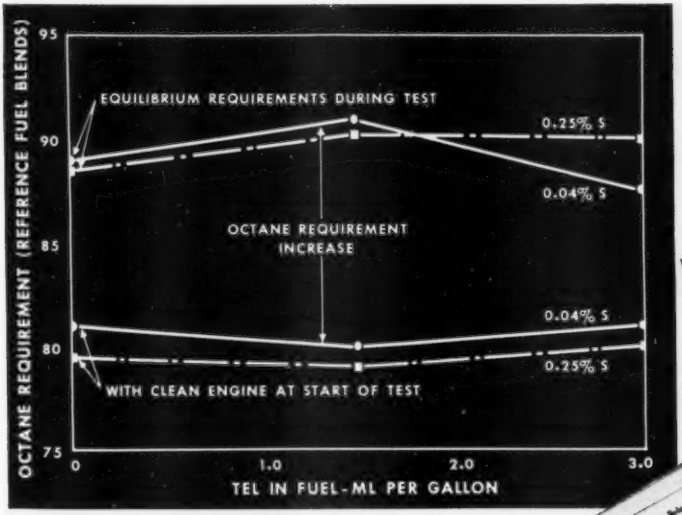
Rockwell Manufacturing Company
400 N. Lexington Avenue, Pittsburgh 8, Pa.

Rockwell Built
Nordstrom Valves

Lubricant Sealed to Keep Upkeep Down

Another ROCKWELL *Product*

Wherever you are in the oil fields, there's a supply house nearby with Nordstrom valves and Nordstrom service.



This chart shows the results of tests conducted as part of a program carried on at the Du Pont Petroleum Laboratory to determine the factors affecting octane requirement increase. The clean engine requirements at the start of each test and the equilibrium requirements observed are plotted as a function of the amount of tetraethyl lead used.

HOW DO ENGINE DEPOSITS AFFECT OCTANE REQUIREMENTS?

Du Pont Petroleum Research offers new findings

Deposits are generally admitted to be a contributing cause to engine knock. Since knock has long presented a problem to petroleum and automotive engineers, the results of Du Pont deposit studies in connection with knock may be of interest to you.

Data from these studies show, for example, that knocking tendency of the combustion chamber deposits is independent of the amount of both tetraethyl lead and sulfur present in commercial type fuels and lubricants. Fuels containing up to a 3.0 ml TEL per gallon were used in the tests.

The Du Pont Petroleum Laboratory also investigated the volume effect, the catalytic action and the thermal insulating effect of deposits on octane requirement. The results indicate that the effect of deposits in increasing knocking tendency is not primarily catalytic . . . but that the volume and thermal insulating effects of deposits both contribute to raising octane requirement.

As part of the work in helping refiners obtain knock-free fuel performance through the use of tetraethyl lead compounds, Du Pont has made the findings of these studies available in booklet form. Ask your Du Pont representative for a copy of "Possible Mechanisms By Which Combustion Chamber Deposits Accumulate and Influence Knock" . . . or write direct to the nearest district office.

DU PONT
REG. U.S. PAT. OFF.

Better Things for Better Living . . . through Chemistry

Petroleum Chemicals

E. I. DU PONT DE NEMOURS & COMPANY (INC.)
Petroleum Chemicals Division • Wilmington 98, Delaware

District Offices: New York, N. Y. · Chicago, Ill. · Tulsa, Okla. · Houston, Texas · Los Angeles, Calif.

District Laboratories: Wilmington, Del. · Chicago, Ill. · Tulsa, Okla. · Houston, Texas · El Monte, Calif.

IN CANADA: Canadian Industries Limited—Toronto, Ont.—Montreal, Que.—Calgary, Alta.

The Oil and Gas Journal, published Mondays, copyright 1952, by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910, at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $4 yearly.

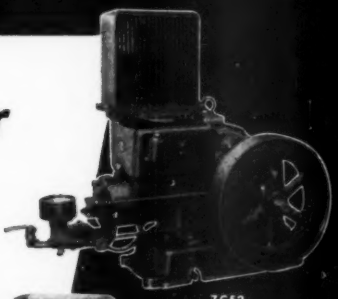
You can Pick the Power to fit the Pump

with the "ZC"

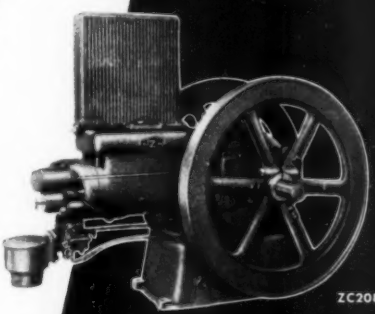
Because the Fairbanks-Morse line of "ZC" Engines is so broad, you can pick the size that will best fit your pumping requirements . . . from 3 to 30 hp.

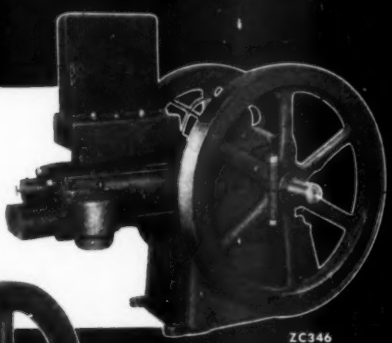
Fairbanks-Morse "ZC" Engines are high displacement, slow-speed, heavy-duty models . . . the ideal type for oil field pumping service. They are economical to operate and maintain . . . simply designed to eliminate need for complicated parts and delicate adjustments. And, *all* have the famous extra heavy, double flywheels that assure smooth, efficient performance . . . with the drive on either side of the engine.

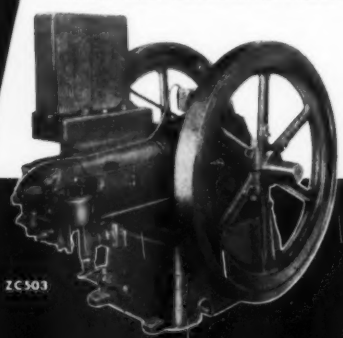
For all the facts, see your local supply store or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

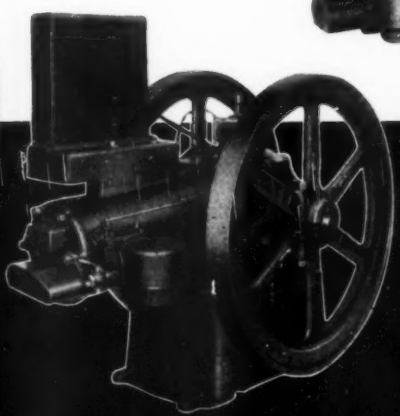

ZC52

ZC118


ZC208


ZC346


ZC503


ZC739

FAIRBANKS-MORSE,

a name worth remembering

OIL FIELD EQUIPMENT • PUMPS • SCALES • ELECTRIC MOTORS • GENERATORS • LIGHT PLANTS • DIESEL, DUAL FUEL AND GASOLINE ENGINES • MAGNETOS • DIESEL LOCOMOTIVES

You had a hand in
MACWHYTE WIRE ROPE

A thousand and one wire ropes
PREformed and internally lubricated

The experience of hundreds of users—like yourself—goes into the making of Macwhyte Wire Rope. For more than half a century, their needs and yours have been studied by our engineers to produce the best wire rope for each job.

There are a thousand and one ropes to choose from. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company.

Macwhyte Company, 2916 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

MACWHYTE COMPANY
KENOSHA, WIS.

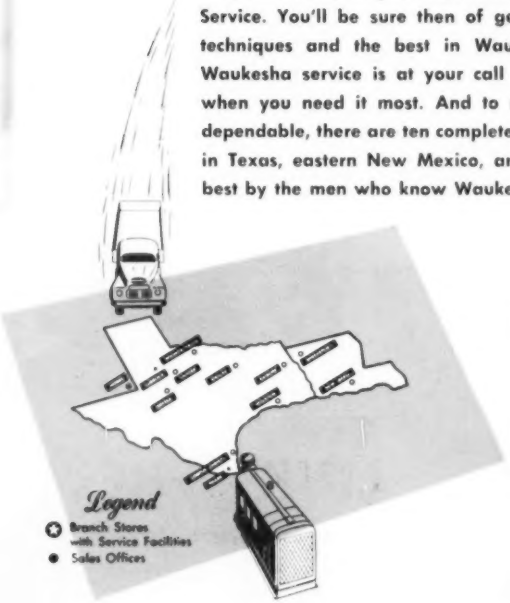
Catalogs are available on request

1017

YOU'RE TREATED BEST AT HOME

YOUR *Waukesha* ENGINE IS TREATED BEST AT HOME, TOO

So for service on your Waukesha Engine call Waukesha Sales and Service. You'll be sure then of getting the latest in factory-service techniques and the best in Waukesha factory-trained mechanics. Waukesha service is at your call twenty-four hours a day to help when you need it most. And to make Waukesha service fast and dependable, there are ten complete service shops strategically located in Texas, eastern New Mexico, and Louisiana. You will be treated best by the men who know Waukesha best.



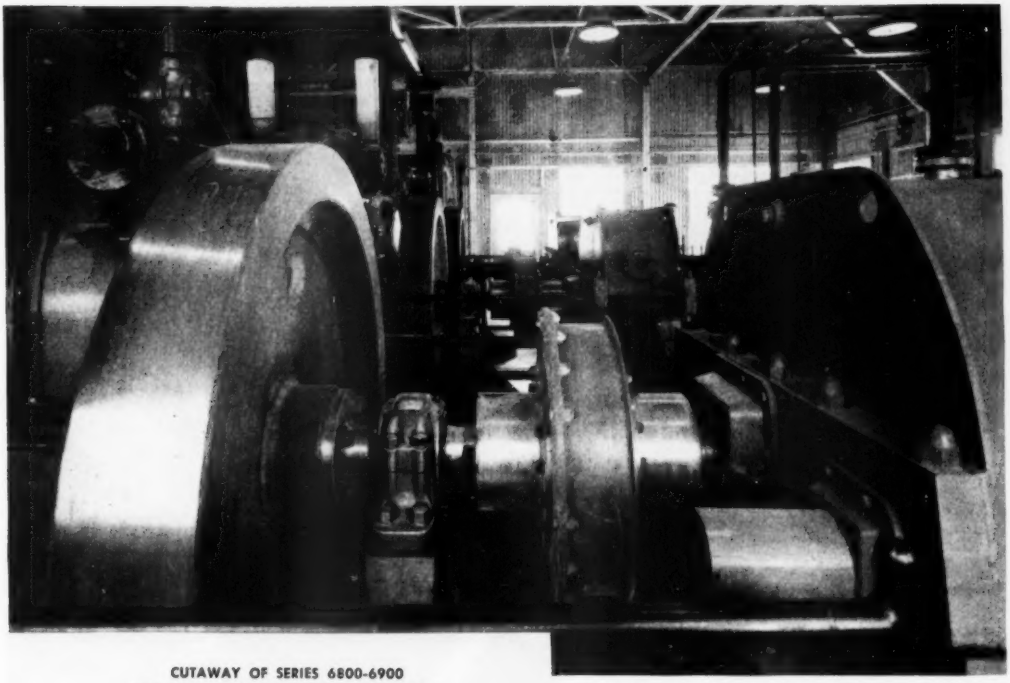
WAUKESHA

SALES & SERVICE, INC.

1422 MAURY STREET • HOUSTON, TEXAS

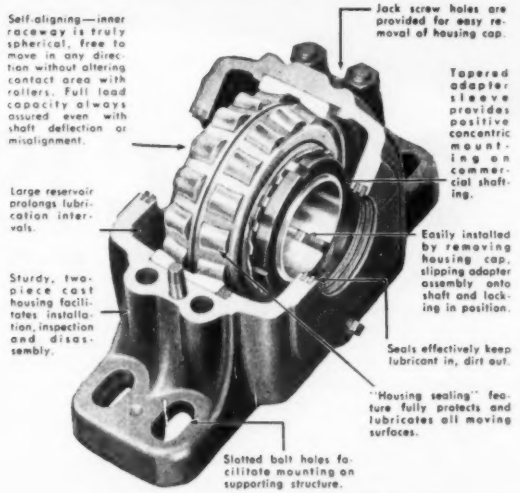
EXCLUSIVE DISTRIBUTORS FOR WAUKESHA PRODUCTS IN TEXAS, LOUISIANA AND EASTERN NEW MEXICO

LINK-BELT Ball and Roller Bearings keep company with America's hardest-working equipment



Link-Belt Series 6800 Roller Bearing Pillow Blocks maintain shaft alignment on these 4-stage lean oil circulating pumps at the Benedum plant of the Texas Gas Products Corporation.

CUTAWAY OF SERIES 6800-6900 TWO-PIECE ROLLER BEARING PILLOW BLOCK


Jack screw holes are provided for easy removal of housing cap.
Self-aligning—inner raceway is truly spherical, free to move in any direction without altering contact area with rollers. Full load capacity always assured even with shaft deflection or misalignment.
Tapered adapter sleeve provides positive concentric mounting on commercial shafting.
Large reservoir prolongs lubrication intervals.
Easily installed by removing housing cap, slipping adapter assembly onto shaft and locking in position.
Sturdy, two-piece cast housing facilitates installation, inspection and disassembly.
Seals effectively keep lubricant in, dirt out.
"Housing sealing" feature fully protects and lubricates all moving surfaces.
Slotted bolt holes facilitate mounting on supporting structure.

One of many types in the Link-Belt line of Pillow Blocks, Flanged, Flanged Cartridge, Cartridge, Hanger, Take-Up Blocks and Unmounted Bearings.

THE efficiency and life of any oil field equipment depend on the quality and accuracy of its bearings. That's why so many designers specify Link-Belt on their heaviest-duty machines.

Link-Belt precision ball and roller bearings have proved—on thousands of applications—that they are the long-life answer for tough service. Integrally self-aligned, they have full load capacity for both thrust and radial loads.

There are Link-Belt ball and roller bearings to meet every oil field need. And a Link-Belt bearing specialist near you will help apply them to your particular requirements. You can also get all the facts from Data Book 2550.

LINK-BELT

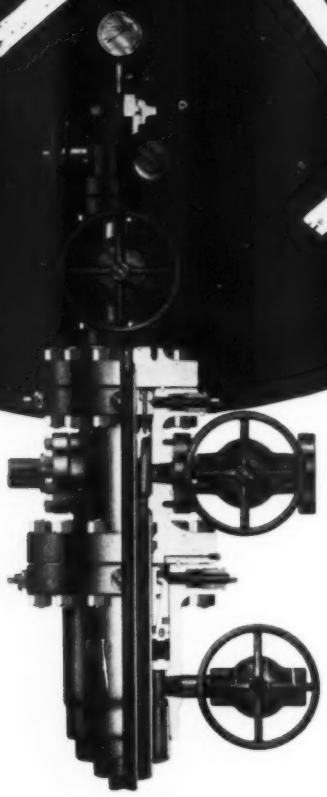
Ball and Roller Bearings

LINK-BELT COMPANY: Indianapolis 6, Dallas 1, Houston 1, Los Angeles 33, Kansas City 8, Mo., New York 7, Toronto 8. Distributors in all fields. 12,651

You'll always win...

WITH THIS LINE-UP!

O·C·T



O·C·T "C·19" CASING HEADS

With the flexible O·C·T "C·19" Casing Head as the foundation . . . the only casing head that meets every well completion condition with a single compact model . . . this O·C·T Wellhead and Tree Assembly has set a new standard for simplicity, for safety, for service.

From top to bottom, this assembly consists of an O·C·T "JE·1" Flow Control, B-2 Bonnet, WA-4 Tubing Hanger, T-16 OU Tubing Head and the C-19 Casing Head.

Yes, it's O·C·T quality from top to bottom . . . labeled by many as the oil industry's most practical wellhead assembly. Write for complete engineering details.

O·C·T products are dependable and available through more than 700 supply store locations.

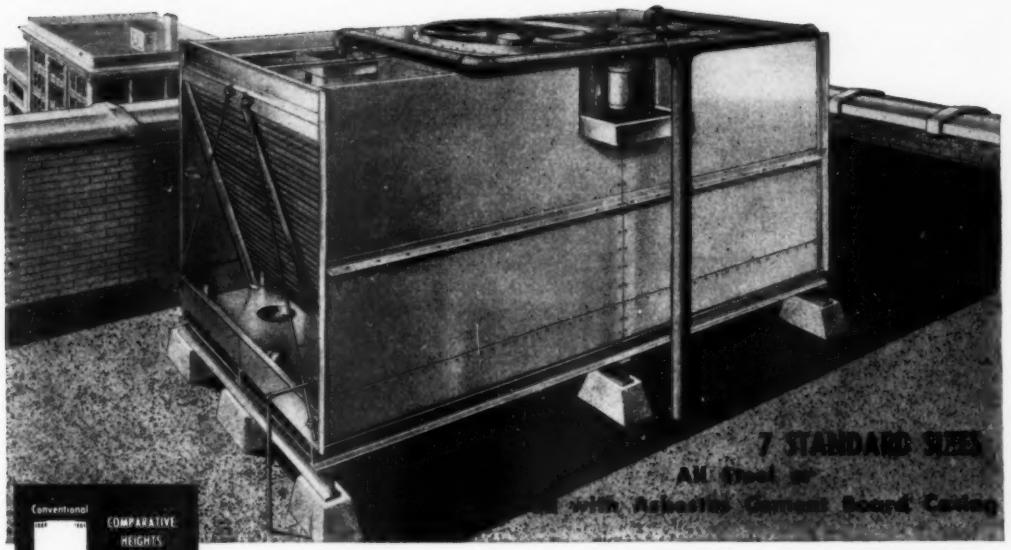
WRITE FOR COMPLETE INFORMATION

Oil Center Tool Co. P. O. BOX 3091 • HOUSTON, TEXAS

Export Representatives: Sterling Areas – Le Grand, Sutcliff & Gell, Ltd., Southall, Middlesex, England. Address Export Inquiries for All Other Countries to P. O. Box 3091, Houston 1, Texas.

NEW DOUBLE-FLOW AQUATOWER

Marley Introduces Lowest Silhouette, Lowest Pumping Head Cooling Towers For Intermediate Capacities



New Simplicity • New Accessibility • New Efficiency

By combining the outstanding features of the large patented Double-Flow and the smaller Aquatower (both accepted leaders in their fields), Marley has produced the cooling tower that will set the standard in another size range . . . THE DOUBLE-FLOW AQUATOWER. Architects, engineers and contractors will be equally enthusiastic about this tower because it is highly efficient, lowest in height and harmonious with building design, and remarkably easy to erect.

The Double-Flow design means low tower height and low pumping head; efficient air utilization—one fan drawing air from two completely open sides—with consequent minimum fan horsepower requirement. Open distribution, "at-a-glance" inspection are features, as are minimum load concentration and economical grillage and support.

From the Aquatower comes simplicity . . . of construction, of piping, of operation. The nailless Redwood filling that is very easily installed or removed is another adaptation. All basin fixtures are readily at hand. Double-Flow Aquatower mechanical equipment is all designed, manufactured and guaranteed by Marley specifically for cooling tower usage . . . and it is all completely accessible.

You'll want complete details of this tower that will fit many installations in many industries, typical of which are those requiring 50 tons or more of refrigeration. Fill out the coupon below and you will receive it immediately.

Producers of
DOUBLE-FLOW TOWERS
AQUATOWERS
VAIRFLO TOWERS
CONVENTIONAL TOWERS
DRICOOLERS
NATURAL DRAFT TOWERS
SPRAY NOZZLES

MARLEY

The Marley Company, Inc.

222 West Gregory, Kansas City 5, Mo.

Send me your 8-page brochure on the new Marley DOUBLE-FLOW AQUATOWER.

Name_____

Firm_____

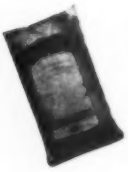
Address_____

City_____ State_____

Protected by Marley Double-Flow Patents

CORRECTION, PLEASE! As the songwriter put it, "it ain't necessarily so!" While salt does play hob with ordinary clay-water drilling muds, salt doesn't upset the stable, easily controlled drilling fluids made with the Baroid products described below. Just pick the one best fitted to your particular problem, and salt water won't worry you again!

BAROCO—An economical, medium yield clay, for the preparation of drilling muds for use in waters containing moderate quantities of salt. Widely used as spud mud and in workover jobs.



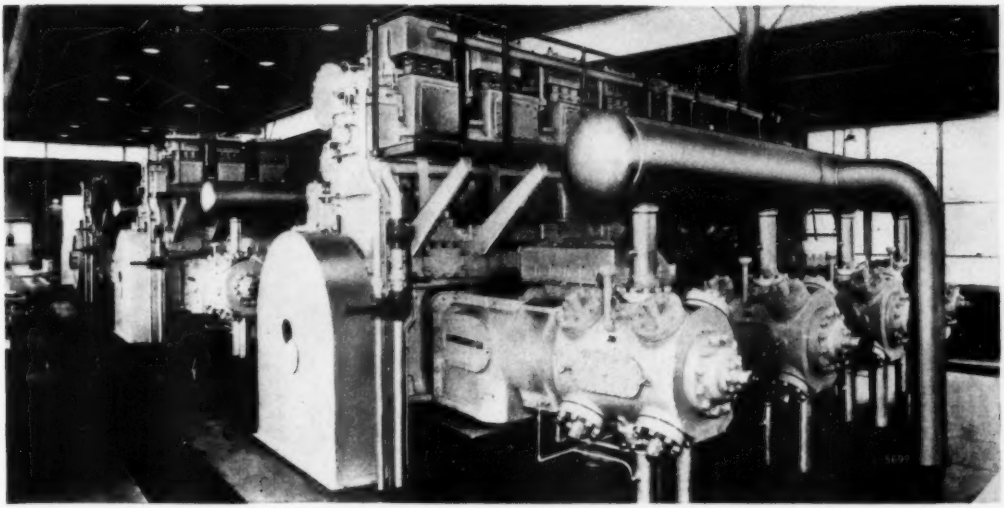
ZEOGEL—A special drilling clay, with high yield, which gives stable viscosity and gel characteristics regardless of the salt concentration. If low filter loss is necessary, however, Impermex should be added to the Zeogel-water mud.

IMPERMEX—Especially prepared starch colloid which is effective in any concentration of salt for controlled filter loss. In fact, saturated salt water (180,000 ppm or up) acts as a preservative.

CARBONOX—Included in this group because this organic mud thinner is used as the emulsifying agent in the preparation of Baroid Emulsion Mud. Baroid Emulsion Muds show good resistance to most commonly encountered contaminants.

Complete drilling mud service

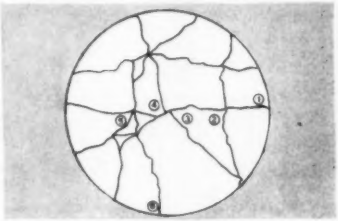
Baroid
BAROID SALES DIVISION
NATIONAL LEAD COMPANY
MAIN OFFICE: HOUSTON, TEXAS—P. O. BOX 1675, HOUSTON 1
HOUSTON—TULSA—LOS ANGELES



WORTHINGTON UTC-16's "on the line" at the Buckley compressor station of Arkansas Louisiana Gas Co., Blanchard, La.

The Worthington count in the Shreveport area—

35 pipeline compressors to produce 53,000 bhp for five companies



COMPRESSOR STATIONS in operation or on order using Worthington UTC-16 Engine Compressors.

Five leading gas-transmission companies have installed or have on order to be installed in the immediate Shreveport area alone a total of 35 Worthington UTC-16 Engine-Compressor units with a combined output of 53,000 bhp.

What makes this Worthington Uniflo Angle Gas Engine Compressor so popular? Take a look at the features and draw your own conclusions:

complete removal of exhaust gas . . . more thorough charging with gas and air . . . positive timing for optimum combustion . . . effective supercharging . . . carbonization prevented by low operating temperatures . . . harmful cylinder stresses eliminated as uniform temperature results in equal cylinder wall stresses.

Take advantage of this great improvement in Engine Compressors for gas transmission. For more facts, write to Worthington Pump and Machinery Corporation, Engine Division, Buffalo, New York.

No.	Station	Total hp	Customer
1	Station 6, West Monroe, La.	12,800	Tennessee Gas Trans. Co.
2	Bienville Station	4,800	Southern Natural Gas Co.
3	Koran Station	4,000	United Gas Pipeline Co.
4	Buckley Station	7,000	Arkansas-Louisiana Gas Co.
5	Marshall Station	10,000	Texas-Illinois Natural Gas Pipeline Co.
6	Station 4, Jasper	14,400	Tennessee Gas Trans. Co.

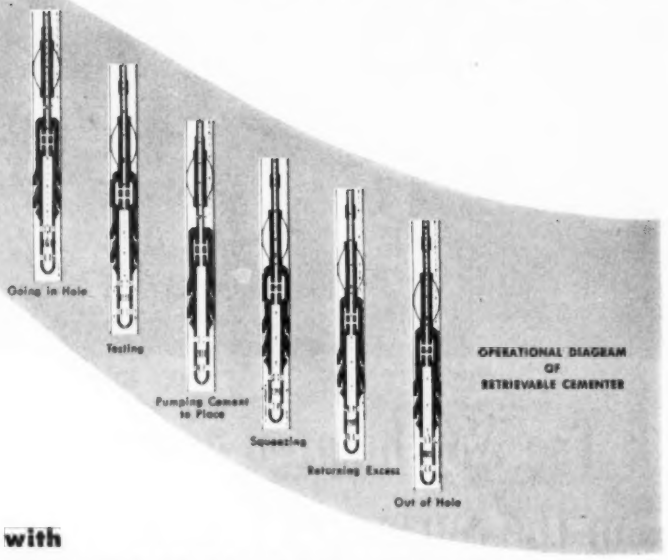
EK.1.3

NO OTHER COMPRESSOR WILL OUTPERFORM A WORTHINGTON

WORTHINGTON

Engine Compressors

save "SQUEEZE" time SUCCESSFULLY



with

HALLIBURTON'S RETRIEVABLE CEMENTER

Less rigtime is lost in squeeze cementing by Halliburton's Retrievable Tool—for it can be run in on tubing or drill pipe to do one or more squeeze jobs in rapid succession, and immediately removed without drilling.

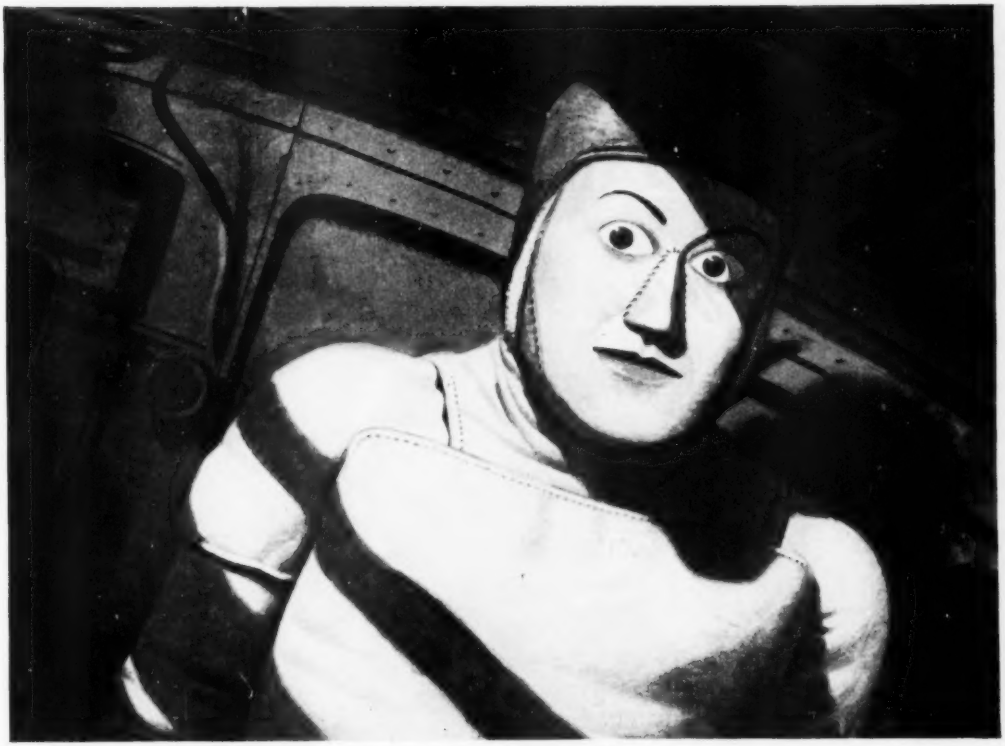
You eliminate the waiting time required for cement to set and the drilling time necessary when drillable packers are used. Ordinarily, you can come out of the hole within an hour after cement is placed.

The simple construction and efficient operation of Halliburton's Retrievable Cementer has made it universally accepted in the industry for successful, time-saving squeeze cementing. It is used economically all over the world for repairing casing leaks, recementing casing or liners, controlling or shutting off unwanted water, correcting channeling, and many other subsurface or remedial squeeze jobs.

This versatile tool, in the skilled hands of Halliburton's field engineers, supported by experience on more than a million wells, is your greatest assurance of successful, economical squeeze cementing. Make a note to phone your nearby Halliburton representative for the next squeeze job. Halliburton Oil Well Cementing Company, Duncan, Oklahoma.

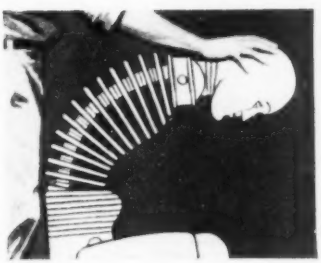
HALLIBURTON

YEARS AHEAD IN SQUEEZE CEMENTING!



Elmer, the Pilot's Friend!

1. **"Born" in a CAA machine shop,** Elmer is a remarkably lifelike steel and rubber dummy, originally designed for studies in improving shoulder harness for pilots. Elmer is so cleverly designed that his compressibility, flexibility, center of gravity, muscular contraction, and natural relaxation are almost exactly that of the human body. He even has a roll of "flesh" above the belt when he is bent over!



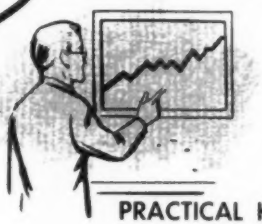
2. **Elmer**—with human reaction to stress and strain—is an example of how Civil Aeronautics Administration scientists worked to improve air transportation. In *automobile* transportation, scientists have also been at work. An advance in this field is Conoco Super Motor Oil. It makes your car last longer, perform better, use less gasoline and oil.

3. **50,000 Miles—No Wear!** After a punishing 50,000-mile road test, *with proper drains and regular care,* engines lubricated with Conoco Super Motor Oil showed *no wear of any consequence:* in fact, an average of less than one one-thousandth inch on cylinders and crankshafts. Gasoline mileage for the *last* 5,000 miles was actually 99.77% as good as for *first* 5,000. Proof that Conoco Super, with OIL-PLATING, *can* keep new cars new!

Now in its 77th year, Continental Oil Company is a leader in oil research and a pioneer in oil-perfecting additives with more than 100 patents on discoveries that improve performance and lengthen the life of your car.

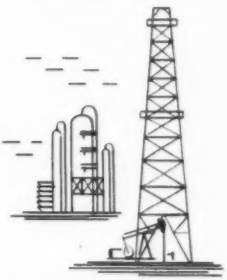
© 1952 **CONTINENTAL OIL COMPANY**

FOR OIL LOAN *Service* THAT *Counts*... SEE



PRACTICAL KNOWLEDGE

CONFIDENTIAL DISCUSSION



FAIR CONSIDERATION

PROMPT DECISION

All these and other services are yours at NATIONAL BANK OF TULSA, because NBT is familiar with the financial needs of oil men and always gives their requirements practical consideration. Our facilities, resources and experience are further assurance that we can be of real service to you, too. See NBT.

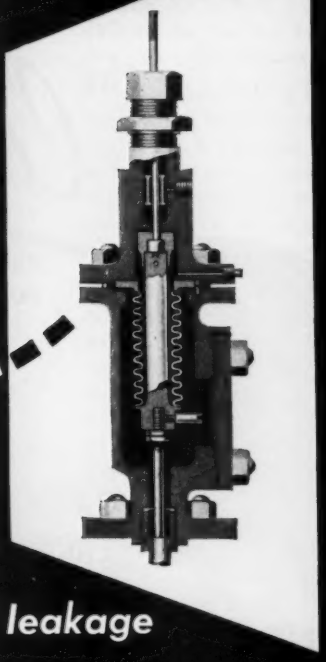
The Oil Bank of America

NATIONAL BANK OF TULSA

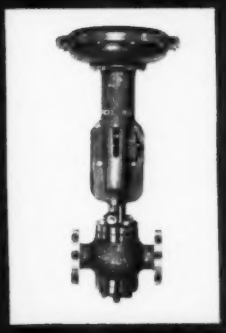
OFFERING COMPLETE BANKING AND TRUST SERVICES

Member Federal Deposit Insurance Corporation

POSITIVE PROTECTION . . .



prevents dangerous or costly leakage



The bellows seal of the Honeywell Series 700 Valve is a metal barrier which insures against loss of valuable or dangerous fluids . . . cannot buckle or twist . . . is precision-machined . . . takes pressures up to 600 pounds. The Honeywell Series 700 wide band proportional control valve comes in a full range of styles and sizes . . . has *all* the features you look for in a fine valve. Write today for your copy of Bulletin 700-2.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division,* 1903 Windrim Avenue, Philadelphia 44, Pa.

MINNEAPOLIS

Honeywell

VALVE PRODUCTS

H HONEYWELL

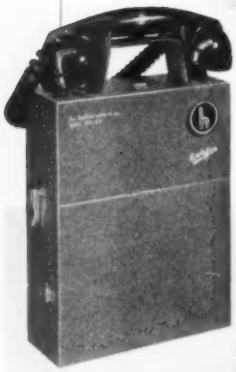
First in Controls

hallicrafters

new, powerful 2-way FM radio-telephone!

the *littlefone*®

SERVES HUNDREDS OF OIL INDUSTRY'S VITAL NEEDS FOR DEPENDABLE, PORTABLE COMMUNICATIONS



HAND CARRY

HT-21 (25-50 Mc.)
HT-22 (150-174 Mc.)

- FULL TWO-WATT ANTENNA OUTPUT*
- Weighs only 14 pounds!
- Complete, self-contained 2-way radio-telephone station!
- Powered by Dry, or Wet Rechargeable Batteries (can be recharged from car battery or 117 Volts AC)
- Rugged, weatherproof
- 22 sub-miniature tubes!

*On 25-50 Mc. • One-Watt output on 150-174 Mc. 10-Pound, Lower Powered Models Also Available

CENTRAL STATION

HT-23 (25-50 Mc.) HT-24 (150-174 Mc.)

Same performance and specifications as the "Littlefone" Hand Carry.

- AC-operated Central Station
- Audio-amplifier, providing one watt of audio for loudspeaker
- Power consumption is 35 watts
- Plugs in any AC outlet (117 Volts)

Where one or more extra stationary receiving stations are desired, Hallicrafters economical S-81 receivers may be added.

A new, versatile, low-cost radiophone to serve all phases of Oil Industry communications. Scores of uses: between deployed units of geophysical crews, pipe line spreads, driller-toolpusher-contractor stores, mobile units in refineries, terminals and field processing plants.

USES OF "LITTLEFONE" CHALLENGE YOUR IMAGINATION!

There are literally thousands of industrial uses for the "*littlefone*" radio—anywhere where powerful, dependable, "on the move" contact is required.

SAVES TIME AND MONEY IN SUCH OIL OPERATIONS AS:

- RIVER CROSSINGS
- FIRE FIGHTING
- COORDINATION AND DIRECTION OF MOBILE UNITS
- TANK GAUGING REPORTS
- PRODUCING LEASE REPORTS
- CASUALTY REPORTS
- EMERGENCY DRILLING
- EXPANDING RADIO NETWORKS
- PIPE LINE AIR PATROL (PLANE TO GROUND)
- OFF-SHORE DRILLING
- STANDBY EMERGENCY COMMUNICATIONS

hallicrafters
"The Radio Man's Radio"

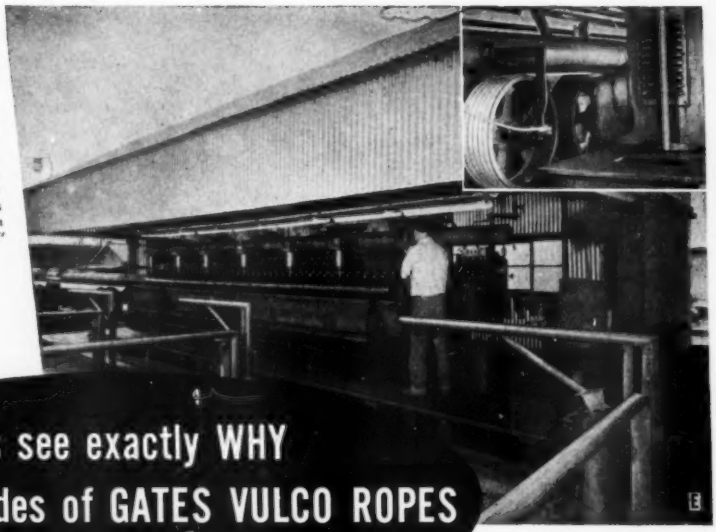
World's Leading Manufacturer of *Precision* Radio and Television — Chicago 24

Compare... FEATURES QUALITY PRICES

- ★ 46" x 10½" brake rings.
- ★ 24" x 40" drum barrel.
- ★ Full vision air panel control, the best control arrangement on any drilling rig.
- ★ Air-Tube disc clutches — the world's best — ON ALL DRIVES.
- ★ New two-speed friction clutch transmission with Air-Tube disc clutches.
- ★ Four speeds to the rotary table.
- ★ New Air-Tube disc clutch on water pump drive controlled from driller's control panel.
- ★ New sectional box type compound, the first of its kind. Each engine and compound section can be moved in one unit without danger of engine getting out of line with compound.
- ★ New Auxiliary Accessory drive built into compound, a feature that is exclusive, so far as is known.

MANUFACTURING CO., Inc.

WICHITA FALLS, TEXAS



Forty-eight horizontal spindles carry milling cutters and simultaneously mill 48 slots in a well casing for the Oil Tool Corp., Long Beach, Calif. Mr. Lloyd Osborne, Machine Operator says of the Vulco Rope Drive: "The machine is really smooth now. There is none of the chattering and vibration we used to have."

Let's see exactly WHY the Concave Sides of GATES VULCO ROPES mean lower V-Belt Costs!

Every engineer knows how a V-belt *changes shape* when it bends around a pulley.

The top of the belt is under tension—making it grow *narrower*.

The body is under *compression*, causing the sides to bulge out!

Look at figure 1-A in the diagrams, herewith. There you see how a *straight sided* V-belt is forced to bulge in its sheave-groove—and this bulging naturally causes extra wear along the middle of the sides as indicated by the arrows.

Now look at the figure 2-A. There you see how the precisely engineered Concave Sides fill out to an exact fit in the sheave groove.

Clearly, the Concave Sides press *evenly* against the V-pulley. This means uniform wear; longer life! The Concave Sides have *full traction;* wear longer because of *full contact!*

To sum up: The Concave Sides of Gates Vulco Ropes (U.S. Patent No. 1813698) give you (1) Less wear, (2) More pulley contact, (3) More sure power transmitted when needed!

Only V-belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure you get the V-Belt with the Concave Sides—The Gates Vulco Rope!

What Happens When a V-Belt Bends

Straight-Sided V-Belt

Fig. 1

Fig. 1-A

How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

Gates Vulco Rope with Concave Sides

Fig. 2

Fig. 2-A

The Concave Sides Fill out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-521

World's Largest Maker of V-Belts

Gates

Hose V-Belts Molded Rubber Goods for Industry

VULCO ROPE DRIVES

ENGINEERING OFFICES AND JOBBER STOCKS IN ALL INDUSTRIAL CENTERS

THE GATES RUBBER COMPANY • DENVER • U•S•A

SCHLUMBERGER RESEARCH...

At Schlumberger... one man in research for every ten men in the field

SCHLUMBERGER WELL SURVEYING CORPORATION

How do you like yours?

WE HAVE BEEN COOKIN' UP ways to be of service to the oil and gas industry for a long, long time . . . yes, even *before* Drake's discovery well fathered the oil industry.

You can't serve an industry that long without picking up some mighty valuable experience. We can now pass the benefits of this experience along to you in the form of better service.

***At no other time* in the long history of this organization have we been as well equipped to serve *your* needs as we are today.**

Give the Jarecki International store in your area a try! Your J-I men are on duty 24 hours a day, 7 days a week to give you fast service around the clock . . . and we can promise you that we have "cooked-up" a brand of service you'll like.

A Division of
H. K. PORTER COMPANY, INC.

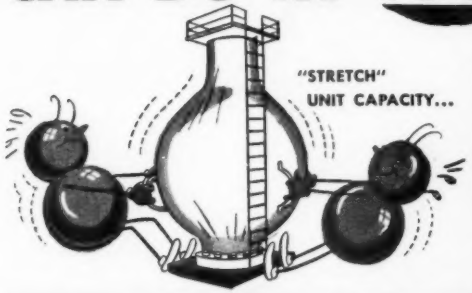
JARECKI INTERNATIONAL SUPPLY DIVISION

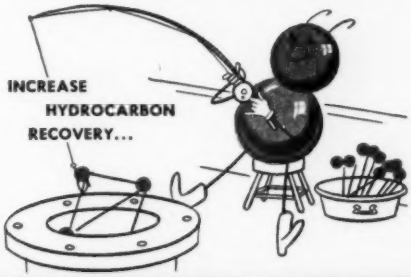
H. K. PORTER COMPANY, INC.

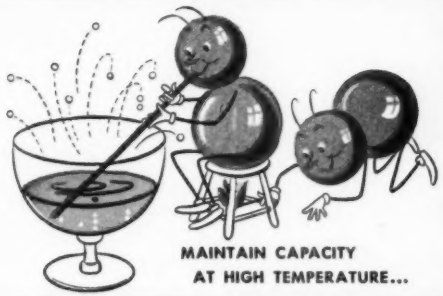
General Sales Office Dallas 1, Texas Atlantic Building

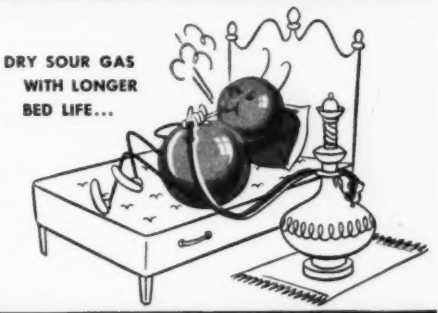
OTHER H. K. PORTER COMPANY, INC., DIVISIONS SERVING DIVERSIFIED INDUSTRIES:
American-Fort Pitt Spring Division; Hinderliter Tool Company Division; Connors Steel Company; Delta-Star Electric Company; Quaker Rubber Corporation.

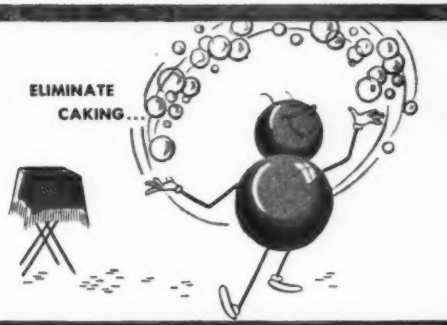
LOOK WHAT MR. SOVABEAD CAN DO IN YOUR DEHYDRATOR!

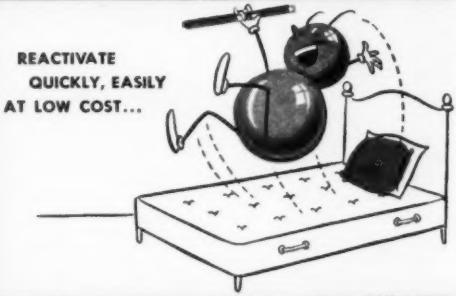












NOW... S/V Sovabead *is recommended* by most leading designers and manufacturers of solid-type natural gas dehydration units... *is used* by a majority of all operators of such units... *is performing satisfactorily* in hundreds of installations throughout the world!

Let S/V Sovabead improve *your* dehydration operations. Call your Socony-Vacuum Representative today!

SOCONY-VACUUM

Process Products

Process Products
SOCONY VACUUM

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates:
MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

EXTRA-TOUGH BRONZE VALVES

FOR LEAK-PROOF SERVICE!

Usual Bronze Valve Diaphragm Construction

Hancock Bronze Valve Diaphragm Construction ... 125% to 230% Stronger

When you buy bronze valves, get what you want – greatest efficiency, longest service, biggest savings. Extra-tough Hancock Bronze Valves assure *all three* with features like these:

- ✓ "500 Brinell" Stainless Steel Plug Seat and Disc prevent leaks.
- ✓ 125% to 230% Stronger Diaphragm than ordinary bronze valves.
- ✓ Hard-Rolled Bronze Stem (Acme threads) takes the roughest treatment.
- ✓ Long-Lasting, Seal-Tight Packing cuts maintenance.
- ✓ Real Back Seating makes packing easy under pressure. Direct seat between stem and bonnet — away from heat and flow of pressure media.
- ✓ Rigid Body, Bonnet and Bonnet Ring of durable steam bronze withstand installation and service abuse.
- ✓ Cool, Comfortable Handwheel built to operator specifications.

Durable Hancock Bronze Valves are made in sizes from ¼" through 2" – globe and angle types, screwed ends — for 150#, 200# and 300# W.S.P. ratings. Phone your nearby Hancock Distributor for prompt delivery. Remember, Hancocks cost no more than ordinary bronze valves.

When Hancocks go in, valve costs go down.

1877 HANCOCK U.S.A.

MAXWELL MANNING MM TRADE MARK

HANCOCK VALVES

A product of **MANNING, MAXWELL & MOORE, INC.** WATERTOWN 72, MASSACHUSETTS

MAKERS OF 'HANCOCK' VALVES, 'ASHCROFT GAUGES, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN' INDUSTRIAL INSTRUMENTS. BUILDERS OF "SHAW-BOX" CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES.

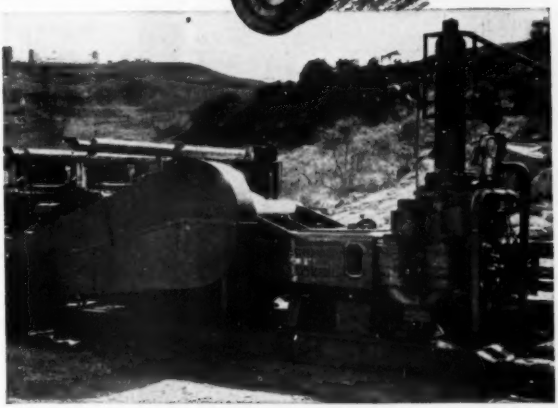
only genuine GARDNER-DENVER slush pump parts

equal GARDNER-DENVER slush pump quality!

Only Gardner-Denver has a fatherly interest in helping you cash in on all the fine performance and long life we've built into your Gardner-Denver Slush Pumps. That's why it pays you to insist every time on *genuine* Gardner-Denver Slush Pump Parts.

Remember, only Gardner-Denver has the authoritative knowledge to give you maximum value in materials and design—only Gardner-Denver parts are engineered to match the high quality of your Gardner-Denver Slush Pumps.

It's easy to get the genuine Gardner-Denver parts you need. Branch offices, stores and agents are located in all oil fields throughout the world. Factory-trained servicemen are readily available to help you install Gardner-Denver parts.



SINCE 1859 **GARDNER-DENVER**

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

Dallas • Houston • Tulsa • St. Louis • Los Angeles • San Francisco
New York • Chicago • Pittsburgh • Denver • New Orleans
Continental Supply Co., Continental Bldg., Dallas, Texas
Export Division: 30 Rockefeller Plaza, New York, N. Y.
Republic Supply Co., (Of Calif.), 2600 S. Eastland Ave., Los Angeles, Calif.

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

HUMBLE

QUALITY LUBRICANTS SERVE THE Gas Transmission Industry

• Humble industrial lubricants will keep engines and compressors in pumping stations in top working condition. They minimize engine wear, save maintenance, prolong life.

Velvet CC—A straight mineral oil with high viscosity index. Its 100% paraffin base stock makes it resistant to oxidation and formation of troublesome deposits.

7075—A solvent extracted naphthenic base lubricating oil for use where exhaust port deposits tend to be a problem. It is of medium viscosity index and contains an oxidation inhibitor.

Detergents—Comparable oils containing effective detergent additives are available to meet the demands of the industry.

Always specify Humble industrial lubricants for your needs. Trained lubrication engineers will recommend the particular lubricant that best suits the job to be done.

HUMBLE

HUMBLE OIL & REFINING CO.

P. O. BOX 2180 HOUSTON, TEXAS

100 temperatures recorded

by One

Speedomax recorder

Esso

phenol extraction unit
Bayonne, N. J.

It would take six 16-point recorders—each with its own chart—to give the same information which is concentrated on the one chart of the 100-point Speedomax Recorder shown above. Reading one chart instead of six saves time—a busy man can check temperatures more often. The danger of mistakes resulting from a comparison of six separate charts is eliminated.

Minimized Cost Per Thermocouple Point

Instrument cost per point recorded is less than that for any other L&N recorder! Panel space is reduced by two-thirds. Scanning of 100 points during a heat balance check requires only six minutes, forty seconds. If, like Esso, you are interested in only 20 of the 100 temperatures as long as the process is operating smoothly, you can read them in only 80 seconds.

You need not provide for 100 thermocouples unless you need them, since instrument capacities range from 40 to 160 points. Four types of operation are always at hand:

1. **Continuous Indicating but no Recording.** All points are indicated in succession.
2. **Automatic START-STOP.** In this type of operation, a specified temperature limit is set. As long as no thermocouple point exceeds this limit, the Speedomax simply indicates. But if any point should exceed the limit, automatic recording of all points begins and an alarm is sounded to summon the operator. Thermocouple connections are grouped in banks of 20, and a different temperature limit can be set for each bank.
3. **Continuous Recording.** Automatic recording of all points.
4. **Selective Indicating or Recording.** Indicating or recording of any bank, combination of banks, or single point.

To get more facts, write our nearest office, or 4959 Stenton Ave., Phila. 44, Pa. Ask for Folder ND46-33A(1).

LEEDS NORTHRUP

Jrl Ad ND46-33-702(3)

When you say **STOP** with the right **WALWORTH** valve, every applicable law of mechanical engineering is squarely behind you.

Walworth, oldest valve and fitting manufacturer in America, makes a valve to control the flow of traffic, so to speak, in every phase of drilling, producing, transportation, and refining.

WALWORTH

AMERICA NEEDS SCRAP TO MAKE MORE STEEL

Jones & Laughlin Supply Company

82 STORES • 17 OFFICES • 7 RESIDENT SALESMEN
General Offices: TULSA, OKLAHOMA

J&L STEEL

Looping WEST OF GUADALUPE STATION

goes another Republic Electric Fusion Welded Pipe Line—32 miles long

This big pipe goes in *fast*. Its circumference always is constant, so field joints line up accurately and quickly. The entire circumference can be welded at top speed.

Its uniform wall thickness provides an even distribution of metal, which further speeds field welding of circumferential joints.

This high pressure line pipe is electric fusion welded inside and out. Then, it's hydraulically expanded to uniform size, straightness and circumference. Hydraulic expansion also increases its yield strength for safer handling of high pressures.

All facilities of Republic's completely integrated mill at Gadsden, Alabama, are 100% devoted to production of expanded Electric Fusion Welded Line Pipe—in sizes 24 through 30-inch OD. Republic is doing everything possible to see that the big pipe is ready for its big jobs.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Dept.: Chrysler Building, New York 17, New York

Crew is lining up two 30-foot lengths of 30" O.335" wall, Republic Electric Fusion Welded Line Pipe that has been double jointed. Pipe is going into El Paso Natural Gas Company's 32-mile loop, west of their Guadalupe Station.

Republic
REPUBLIC STEEL
ELECTRIC FUSION WELDED LINE PIPE

When planning your pipe line ... plan for protection

Bitumastic 70-B Enamel being machine-applied to a 20-inch gas transmission line.

Specify BITUMASTIC® ENAMEL

PIPE-LINE engineers are proud of their completed pipe-line projects. They are the result of careful planning, expert engineering skill and plenty of hard work. And these projects deserve the best possible protection against corrosion — the protection provided by Bitumastic Enamels.

"The best possible protection against corrosion"— this claim is based on actual service records . . . on *proved* performance. Many pipe lines are still carrying gas and oil underground, after more than 30 years good service. And these durable enamels have established these records under the most severe corrosive conditions.

Further, the experience gained by Koppers in safe-guarding thousands of miles of pipe lines against corrosion is available to you. Discuss your next pipe-line project with one of our representatives. He will give you complete details concerning Bitumastic Enamels.

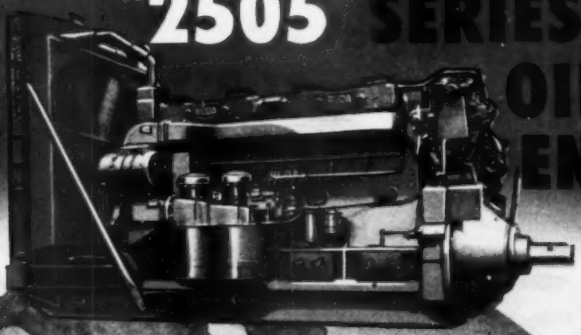
Bitumastic Enamels soon available from Koppers new California Plant!

As soon as present construction work is completed, Koppers will be able to supply Bitumastic Enamels from a new plant at Fontana, California. The plant is being built to give you better service in the west.

KOPPERS **BITUMASTIC** ENAMELS
REG. U.S. PAT. OFF.

KOPPERS COMPANY, INC., Tar Products Division, Dept. 305-T Pittsburgh 19, Pa.

Be on top WITH BUDA "2505" SERIES OILFIELD ENGINES



BUDA

WHEREVER THERE'S OIL THERE'S BUDA ENGINES PARTS AND SERVICE

Buda "2505" Series Oilfield Engines and the "Fuseomizer Kit"* give you a world of power, acceleration and smooth operation PLUS double protection from high fuel costs. Get on top of the oilfield power problem with "2505" Series Engines. Ask your nearby Buda Oilfield Distributor for details today.

*Permits quick, low-cost conversion from full Diesel to full gas operation, or vice-versa.

BO-25

BUDA Oilfield Distributors are located at: Dallas • Tulsa • Los Angeles • Houston • Oklahoma City • Seminole • Wichita Falls • Shreveport • Bakersfield • Tinsley • Pampa Great Bend • Long Beach • Kilgore • Mt. Carmel, Ill. • Alice • Odessa • Casper • Denver • Brookhaven • New York City (Export) and in Canada at Calgary and Edmonton

Which one of these valves will solve your problem?

If you need a production valve to handle extremely high pressures, or corrosive fluids, or distillates, McEvoy makes a valve for you! McEvoy Valves first became known because they could handle the "tough jobs".

If you need a low-pressure, low-cost valve that will give long, dependable service, one of the valves shown here will answer your requirements.

All McEvoy Valves have the same exclusive features that mean easy operation, positive sealing, and long life. Write for full information.

Now **IMMEDIATE DELIVERY on McEvoy Valves!**

Greatly increased production facilities have made it possible for us to keep pace with the soaring demand for McEvoy Valves. As a result, we can offer immediate delivery on many orders and delivery within a very short time on *any* order. Ask us for delivery quotations on your valve requirements.

3261

McEvoy COMPANY

TEXAS AND MILBY ST.
P. O. BOX 3127
HOUSTON 1, TEXAS

EXPORT REPRESENTATIVE: E. F. GAHAN, INC., ROOM 1223, 500 FIFTH AVENUE, NEW YORK, N. Y.

Cummins® Diesels do so many jobs-so much better

Shovels, cranes, industrial locomotives

Drilling rigs, centrifugal pumps, generator sets

Buses and on-highway trucks

...because they're custom-built to fit the job

Earthmovers, logging yarders and loaders

Off-highway trucks, crawler tractors

Work boats, pleasure craft

Lightweight, high-speed Diesels (50-550 hp) for these and many other uses

---

...because they're

BUILT NOT ONCE BUT TWICE

Rugged, lightweight, high-speed Cummins Diesels are at work everywhere. Each engine is built *twice*. It's assembled, run-in tested, disassembled and inspected, then reassembled and tested again. This extra care in building, plus Cummins exclusive fuel system and an efficient and expanding service and parts organization, means minimum "down time", more power and profits for the user. See your Cummins dealer.

CUMMINS Quality DIESEL

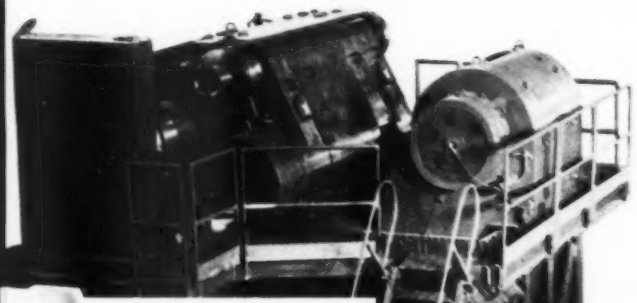
TRADEMARK REG. U. S. PAT. OFF.

Diesel power by CUMMINS

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

Export: Cummins Diesel Export Corporation • Columbus, Indiana, U.S.A. • Cable: Cumdiex

EMSCO'S 2 new big rigs

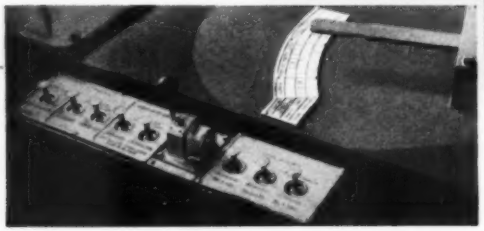


CHOICE OF 4 DRIVES

Mechanical
Fluid Coupling
Electric Coupling
Torque Converter

All air controls and instruments of the J-1100 and J-1400 are centralized in a console at the driller's position.

This photograph shows the "two-step" set up of a J-1100 Rig. The J-1400 is identical to the J-1100, except for larger dimensions.



Shown in the oval above is Emsco's exclusive five-position one-lever control that permits compounding of engines in any required combinations. In foreground are engine and pump clutch controls and local engine throttle controls.

E-113-52

EMSCO DERRICK & EQUIPMENT COMPANY
Houston, Texas • LOS ANGELES, CALIFORNIA • Garland, Texas

CONTINENTAL

"SERVING THE OIL AND GAS INDUSTRIES"

THE CONTINENTAL SUPPLY COMPANY, General Offices: DALLAS, TEXAS
Export Div., The Continental Supply Co., Inc., 30 Rockefeller Plaza, New York, N.Y.
The Continental Supply Company, Limited, 216 Lancaster Bldg., Calgary, Alberta

Representatives: Argentina, Bolivia, Brazil, Chile, Colombia, England, Ecuador, Peru, Trinidad, Uruguay, Venezuela

OFFER YOU MORE IN DEEP DRILLING ECONOMY

You get maximum portability and operating flexibility

Here are two rigs that can definitely lower your deep drilling costs! They offer the greatest flexibility . . . portability . . . versatility . . . and economy of operation yet provided in rigs of their size.

The J-1100 and J-1400 can be tailored to the individual customer's needs. For instance, you can have the type of drive you prefer: mechanical, electric coupling, fluid coupling or torque converter. And you pay no price penalty for this versatility.

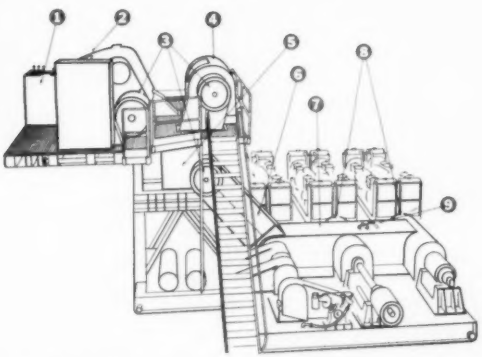
The key to Emsco's exclusive "packaged design" is an independent selective speed transmission that eliminates long chain and belt drives and permits you to have the type of set up that best meets your requirements.

Drawworks, selective speed transmission and compounding transmission are packaged separately and in 8-foot roadable widths. A sand reel, independent of the drawworks, is optional.

The control system of the J-1100 and J-1400 has been simplified, with controls brought into a separate console at the driller's position. This includes controls of auxiliary equipment, all being driven through the compounding transmission.

For detailed information about these outstanding new, big Emsco Rigs call CONTINENTAL.

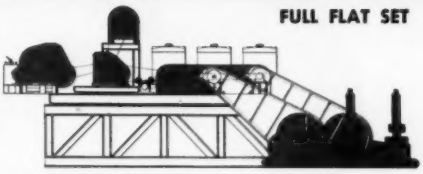
Features of J-1100 and J-1400



1. Console control, with all controls at driller's position.
2. Larger drums.
3. Clutches mounted on ends of shafts to simplify servicing.
4. Optional sand reel mounted independent of the drawworks.
5. Separate selective transmission package eliminates long chain and belt drives.
6. All chain drives and shaft bearings are pressure lubricated from built-in oil pumps.

EMSCO'S "PACKAGED DESIGN" ELIMINATES LONG CHAIN AND BELT DRIVES . . . PERMITS YOU TO USE ANY DESIRED SET UP

FULL FLAT SET



Drawworks, selective speed transmission, compounding transmission set at derrick floor level. Optional sand reel set on light sub-base over selective speed transmission. This type of setting is generally used for offshore, barge and piling locations.

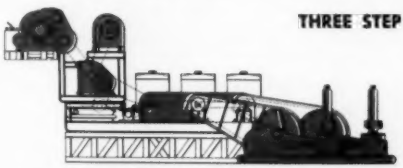
ONE STEP

Drawworks set at derrick floor level with selective speed transmission and compounding transmission set at an intermediate level. Slush pumps are set at ground level. Optional sand reel located directly over the selective speed transmission at derrick floor level.

TWO STEP

Most common arrangement. Compounding transmission and slush pumps set at ground level with selective speed transmission stair-stepped between compounding transmission and drawworks. Optional sand reel set directly above selective speed transmission.

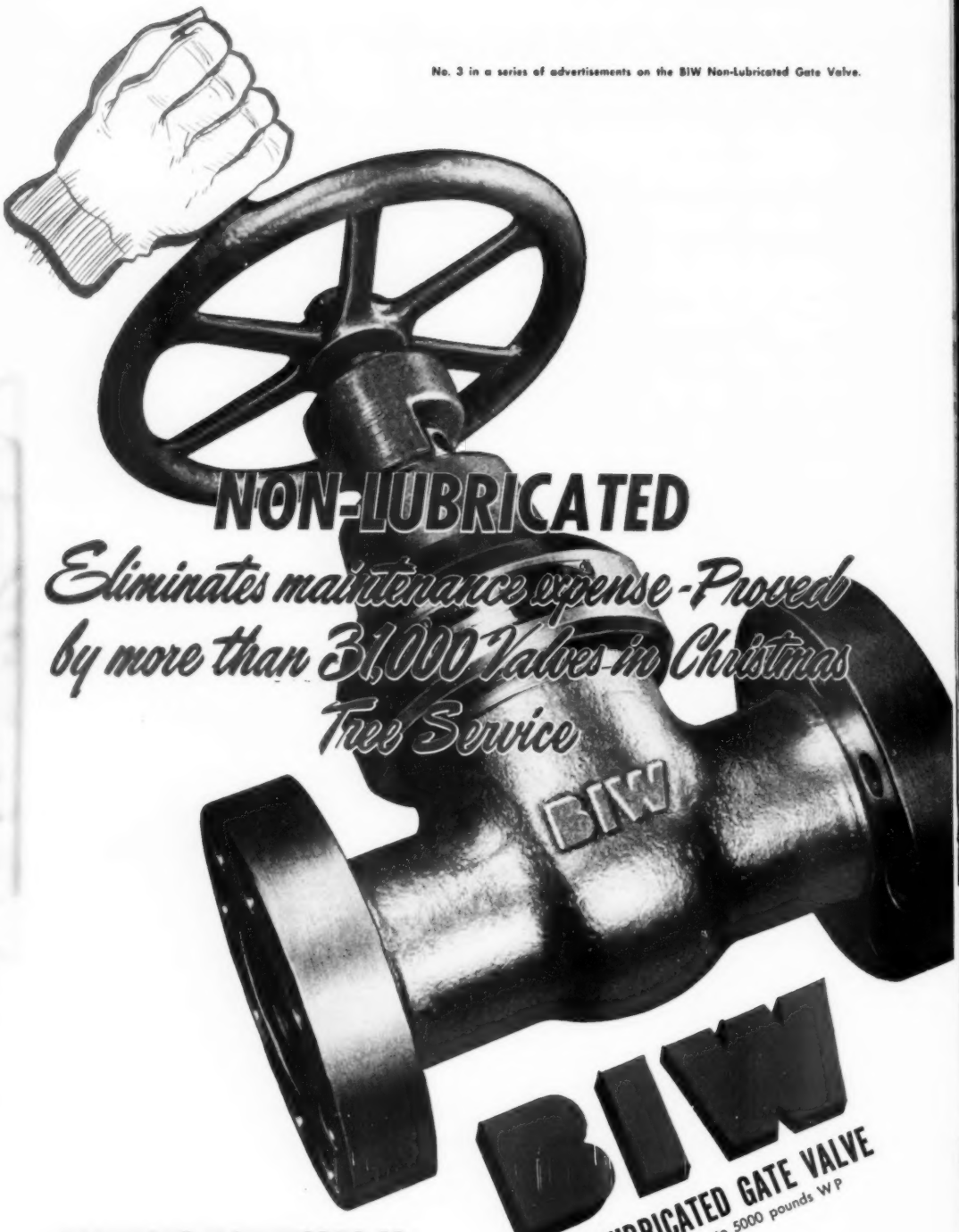
THREE STEP



A special setting generally employed for deep drilling operations and submergible barges requiring heavy blow-out preventer equipment and extra-tall substructures (14 to 24 feet high). Compounding transmission set on three to ten foot sub-base. Note extremely short chain and V-belt drives.

7. Two, three and four-engine compounding transmissions provide ultimate in power flexibility, including driving of all auxiliary equipment. This eliminates need for auxiliary engines.
8. Choice of drives: mechanical, electric coupling, fluid coupling or torque converter.
9. Exclusive five-position one-lever control simplifies compounding of engines in any desired arrangement.

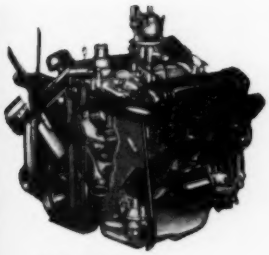
No. 3 in a series of advertisements on the BIW Non-Lubricated Gate Valve.


NON-LUBRICATED
Eliminates maintenance expense - Proved by more than 31,000 Valves in Christmas Tree Service
BIW
BIW
NON-LUBRICATED GATE VALVE
Oil — Water — Gas to 5000 pounds W P

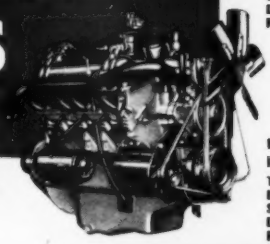
BEAUMONT IRON WORKS CO.
BEAUMONT, TEXAS
A Subsidiary of American Locomotive Company
Atlas Engineering Works, exclusive sales agents

FORD ANNOUNCES THREE NEW *Heavy Duty* INDUSTRIAL ENGINES

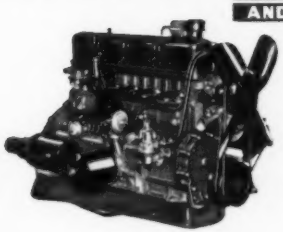
Ford
INDUSTRIAL ENGINES
AND POWER UNITS



FORD "317"
INDUSTRIAL ENGINE
Type—V-8, 90° Overhead Valve.
Bore—3.8 inches.
Stroke—3.5 inches.
Displacement—317 cu. in.
Rating (dyn.)—140 b.h.p. @ 2800 rpm.



FORD "279"
INDUSTRIAL ENGINE
Type—V-8, 90° Overhead Valve.
Bore—3.56 inches.
Stroke—3.5 inches.
Displacement—279 cu. in.
Rating (dyn.)—125 b.h.p. @ 2800 rpm.



FORD "215"
INDUSTRIAL ENGINE
Type—6 cylinder Overhead Valve.
Bore—3.56 inches.
Stroke—3.6 inches.
Displacement—215 cu. in.
Rating (dyn.)—93 b.h.p. @ 2800 rpm.

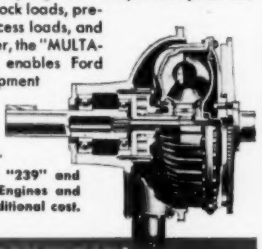
Designed and Built for INDUSTRIAL APPLICATIONS

● Now, manufacturers and users of industrial powered equipment have a choice of six great Ford engines . . . all especially designed for industrial applications and incorporating notable advancements for still greater performance and operating economy. With the three new series pictured here and three series in the present line, there is a choice of six engines ranging from 120 to 317 cu. in. displacement.

Our experienced Sales Engineers are at your service in developing engineering recommendations for the most efficient use of Ford Industrial Power in your application.

AND A NEW MULTA-TORQUE CONVERTER

The new Ford "MULTA-TORQUE" Converter offers all the advantages of fluid coupling PLUS torque multiplication. Designed to absorb shock loads, prevent stalling under excess loads, and start bigger loads faster, the "MULTA-TORQUE" Converter enables Ford Engines to power equipment normally requiring much larger, more costly engines in the same applications.



Available with "215," "239" and "254" Ford Industrial Engines and Power Units at low additional cost.

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED

All six engines in the 1952 Ford Line are available as assemblies or complete Power Units, closed or open type.

Ford Industrial Engines and Power Units are RIGHT 3 WAYS for your job!

1. **RIGHT POWER** for your job—six great engines available in both Power Units and Engine Assemblies.
2. **RIGHT FEATURES**—all the latest advancements of Ford's famed progressive engineering.
3. **RIGHT SERVICE**—Ford Industrial Engine Service is **Nationwide.** Parts obtainable quickly from your nearest Ford Dealer.

MAIL THIS COUPON TODAY!

INDUSTRIAL ENGINE DEPARTMENT
FORD MOTOR COMPANY
15050 Woodward Ave., Highland Park 3, Mich.

We are interested in Industrial Power for:

_____
(state your application)

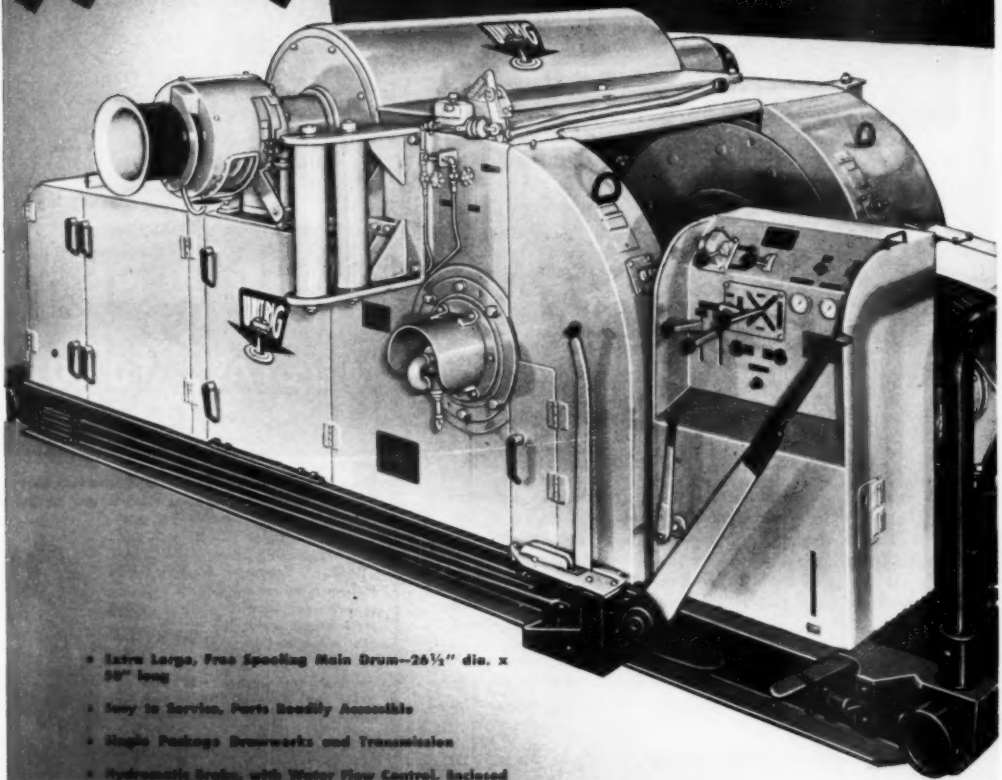
Send us 1952 literature on Ford Industrial Engines checked below:

☐ "120" 4-Cyl. ☐ "215" 6-Cyl. ☐ "239" V-8
☐ "254" 6-Cyl. ☐ "279" V-8 ☐ "317" V-8
☐ "MULTA-TORQUE" Converter

FIRM NAME _____
(Please Print)
STREET _____
CITY _____ ZONE _____ STATE _____

DRILLERS dreamed of

NEW UNIT RIG'S U-20



- Extra Large, Free Spooling Main Drum—26½" dia. x 50" long
- Easy to Service, Parts Readily Accessible
- Single Package Drawworks and Transmission
- Hydromatic Brake, with Water Flow Control, Enclosed in Main Case
- Quickly Converted to Single or Double Drum Unit

UNIT RIG DRAWWORKS ARE SOLD EXCLUSIVELY THROUGH THESE AUTHORIZED DISTRIBUTORS IN U.S.A. AND CANADA

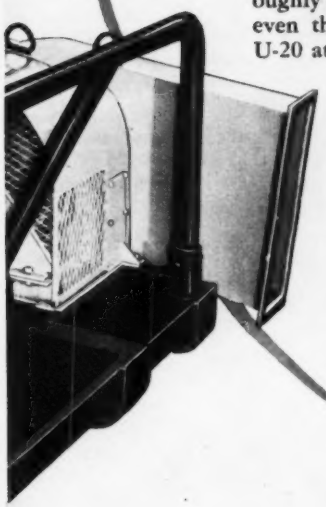
BOYAIRD SUPPLY COMPANY
HOUSTON OIL FIELD MATERIAL COMPANY
HOWARD SUPPLY COMPANY
IVERSON SUPPLY COMPANY
JONES & LAUGHLIN SUPPLY COMPANY
LUCEY PRODUCTS CORPORATION
MID-CONTINENT SUPPLY COMPANY
NORVELL-WILDER SUPPLY COMPANY
OIL WELL SUPPLY COMPANY

EXPORT SALES — MID-CONTINENT SUPPLY COMPANY, 42 Broadway, New York City. Cable — MIDUNITRIG

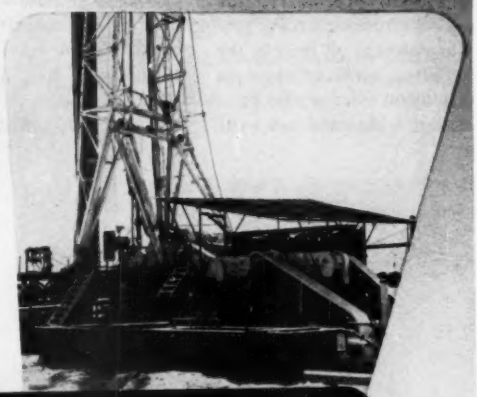
it....NOW IT'S HERE!

Drill ECONOMICALLY 7,500 ft. to 12,000 ft. with ONE rig!

Here is the versatile drawworks you've been wanting. It is available with single or double drum, applicable to torque converter drive, fluid coupling drive or direct mechanical drive power units; and, is easily converted from one style drive to another . . . in the field. The Model U-20 is, of course, designed for portability and free from excess weight. It has been thoroughly tested in the field and its performance has surpassed even the designers' expectations. Inquire about the Model U-20 at your Supply Store.



Pictured is the second Model U-20 to be placed in operation. Contact us for performance data on this newest member of the Unit Rig Family of Drawworks.



› Write for NEW Catalog

UNIT RIG & EQUIPMENT CO.
TULSA, OKLAHOMA, U.S.A.

DESIGNED FOR THE JOB.

This could happen only in America

A 50th Birthday Message from The Texas Company

FIFTY years ago a tiny company was started in Beaumont, Texas, where oil had just been discovered.

This company started with one tract of land which might contain oil, one storage tank, one short stretch of pipe line, one pile of bricks for building a refinery—a little money and a lot of hope.

On its golden anniversary, this company has 9,700,000 acres of producing or potential oil land in the United States, owns or operates more than 7,000 miles of pipe lines, drills close to a thousand new wells each year, has refineries, oil storage tanks, distributing plants, research laboratories and all the other complex facilities needed to serve customers in every state of the Union and throughout the world.

This company also has today over 100,000 owners—investors whose faith and dollars helped it to rise to its opportunities.

Such things could happen only in America—because only America gives men the freedom to make them happen.

This is a land where men have been free to run risks and reap the rewards their courage and judgment deserve.

It has been a land where men have been free to invent or invest—to pioneer or produce—to the limit of their ability and their vision of what could be done.

It has been a land of independence of thought and action—in which the best man was allowed to win.

The Texas Company has gone it alone in the oil business—asking no favors—standing on its own feet—competing for its share of the business by developing and marketing good fuels and lubricants—seeking no security except that which it could earn.

Other companies have gone it alone in other industries. And we—and they—and America have grown together, beyond anything the world has ever seen.

It is not by accident that America builds 83% of the world's automobiles—generates 42% of the world's horsepower—and produces 51% of the world's oil.

That is why America, over the past fifty years, has been known as "the land of opportunity."

That is also why, in a world which lives today in the shadow of conflict and in an atmosphere of economic uncertainty, America shines as an island of hope for all to see.

THE TEXAS COMPANY

Faithfully Yours for Fifty Years

1902-1952

AT THE BUSINE$$ END OF A PIPE LINE

ROTOCYCLE METERS

MEASURE FASTER, MORE ACCURATELY AND AT LOWER COST

You can be sure when you measure with Rockwell Rotocycle meters—sure to save—sure to gain. You see, these meters operate in a continuous series of revolving cycles. Their free "*flo-ward*" movement offers less resistance to line flow. Hence, with Rotocycle meters you can use smaller motors to move the same volume of through-put.

In addition to offering sizable savings in electricity Rotocyle meters save in maintenance. Periodic inspection and cleaning is easily accomplished without taking the meter from the line. If ever required, the entire measuring assembly can be removed as a unit from the meter body and replaced with a spare.

For accurate measurement *plus* savings in installation and service "Rely on Rockwell." Write for full details.

ROCKWELL MANUFACTURING COMPANY
PITTSBURGH 8, PENNSYLVANIA

Atlanta Boston Chicago Columbus Houston Kansas City
Los Angeles New York Pittsburgh San Francisco Seattle Tulsa

consider this OUTSTANDING ADVANTAGE of the famous WHELAND SWIVEL

WASH PIPE, special nickel alloy steel, carburized, precision machined, wearing surface heat treated to 700 Brinnell hardness, precision ground, polished and honed for maximum smoothness and minimum packing wear. Wash pipe outside diameters are precision machined in one operation assuring perfect concentricity and perfect alignment. No place to form pockets or restrict mud flow.

Wash pipes can be replaced with minimum time and effort. With just average care, the replacement goes in EASILY and in PERFECT ALIGNMENT.

ALSO IMPORTANT: Pressure lubricated, chevron type, controlled stack height, wash pipe packing in extra deep stuffing box. Free flexing packing lips provide positive mud seal. Triple lower grease seal. All packings permanently adjusted, pressure grease lubricated through readily accessible fittings.

All bearings have capacity in excess of Wheland's capacity ratings. Timken main load bearing with radial and thrust above and below to maintain perfect stem alignment. Upper thrust bearing, tapered cone. All bearings positively sealed off from mud and run in circulated, cooled oil. Large oil capacity.

Long radius gooseneck, streamlined manganese vanadium steel body, positive lower grease seal, special hold down construction, freedom from adjustments.

4 WHELAND SWIVEL SIZES

Model E-7000—Capacity 464,300 lbs. at 100 R.P.M.
Model E-6600—Capacity 350,000 lbs. at 100 R.P.M.
Model E-6200—Capacity 262,000 lbs. at 100 R.P.M.
Model E-6100—Capacity 130,000 lbs. at 100 R.P.M.

Bulletin No. 173 sent on request gives details, shows why more and more people are saying: "WHELAND has the best swivel on the Market."

WHELAND

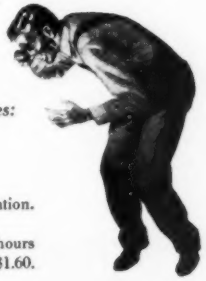
THE WHELAND COMPANY, CHATTANOOGA, TENN., U. S. A.
ROTARY DRILLING MACHINERY

DRAWWORKS • SLUSH PUMPS
ROTARIES • CROWN BLOCKS
TRAVELING BLOCKS • SWIVELS

DOMESTIC DISTRIBUTORS & THEIR HEADQUARTERS: Jones & Laughlin Supply Co., Tulsa, Oklahoma • Houston Oil Field Material Co., Inc., Houston, Texas Iverson Supply Co., Tulsa, Oklahoma • Lucey Products Corporation, Tulsa, Oklahoma • Superior Iron Works & Supply Co., Inc., Shreveport, Louisiana
EXPORT DISTRIBUTOR: Lucey Export Corporation, 233 Broadway, New York 7, New York—Broad Street House, London E. C. 2, England

Short or Long Term CAPITAL LOSS?

No matter how they are figured—
eye accidents are costly to industry.
Here are some of the estimated charges:



1. They cost nearly $400 in average compensation.
2. They cost $176,000,000 in lost man hours annually at an average per hour rate of $1.60.
3. They cost an unknown but sizeable sum in idle machine time. (Remember, industry invests $6,000 or more in tools to provide each job.)
4. They cost another appreciable sum in impaired worker morale.
5. They cost additional money in increased rejects and lowered output when green workers must be substituted for skilled.
6. They cost money in first aid and medical attention whether the eye injury is major or minor.

Any industrial eye accident is a capital loss. If you lose the skill of a valued worker through the loss of an eye, you have a long-term capital loss in a very real sense—with no gain, long or short, to compensate. Contact your nearest AO Branch Office and learn how an AO Eye Protection Program can practically eliminate these costs and pay for itself in less than six months. Or write American Optical Company, 443 Vision Park, for free booklet "Improved Industrial Vision" which tells how AO's Industrial Vision Program cuts costs, increases production, decreases accidents.

American Optical
SAFETY PRODUCTS DIVISION

Southbridge, Massachusetts • Branches in Principal Cities

YOU'LL FIND *LeBus Grooving Service* THROUGHOUT THE OIL PATCH

Strategically located throughout the Oil Country are fully trained Sales and Service Representatives for LeBus Grooving and Wire Line Spooling service. These men are readily available to answer any questions you may have regarding Wire Line grooving and are on call to service your rig whenever needed. If you haven't grooved your rig . . . call on one of LeBus' Sales Representatives and let them show you the advantages of LeBus Grooving and Wire Line Spooling service and how this service can save you valuable drilling time and money.

LEBUS INTERNATIONAL ENGINEERS LIMITED

SPECIALISTS IN GROOVING & WIRE LINE SPOOLING SERVICE

SALES, SERVICE Control and Warehouse Stock: LONGVIEW, TEXAS
Executive Offices: 300 Wichita National Bank Bldg., WICHITA FALLS, TEXAS

EXECUTIVE OFFICE
F. L. LeBus, SR.
LeBus International Engineers, Ltd.
300 Wichita National Bank Bldg.
Wichita Falls, Texas

MANUFACTURING AND WAREHOUSE CONTROL
GENERAL SALES
F. L. LeBus, JR.
LeBus Rotary Tool Works, Inc.
Telephone 1232—P. O. Box 2352
Longview, Texas

MANAGER SALES PROMOTION AND SERVICE
EARL J. CALK
LeBus International Engineers, Ltd.
Telephone 1232—P. O. Box 2352
Longview, Texas

PERMIAN BASIN AREA SALES ONLY
K. C. SLOUGH
Slough Equipment Company
Telephone 2-1968
612 West Kansas
Midland, Texas

Warehouse and Service
L. D. THOMPSON
LeBus Rotary Tool Works, Inc.
Telephone 6-5842
P. O. Box 2855
Odessa, Texas

GULF COAST AREA AND MEXICO
Warehouse Sales and Service
MARVIN PECK AND MARC LAMKIN
Petroleum Engineering & Tool Co.
Telephone YUkon 1343
5710 Harvey Wilson Drive
Houston, Texas

STATE OF OKLAHOMA
Warehouse Sales and Service
C. O. MOORHEAD
M-C-M Machine Works
Telephone Melrose 8-5449
P. O. Box 4583
Oklahoma City, Oklahoma

ARK.-LA.-TEX. AREA
Warehouse Sales and Service
E. FRED SPENCER
Spencer-Harris Machine & Tool Co.
Telephone 117 or LD-4
Gladewater, Texas
Telephone 776
Magnolia, Arkansas

SOUTHERN CALIFORNIA
Warehouse Sales and Service
W. C. JONES
Coastal Engineering Company
Telephone 2-0512
P. O. Box 1618
Bakersfield, California

ROCKY MOUNTAIN STATES
Warehouse Sales and Service
RUSSELL (RUSTY) MOORE
Moore Specialty Company
Telephone 5429J
P. O. Box 657
Casper, Wyoming

ILLINOIS, INDIANA AND KENTUCKY AREA
SALES AND SERVICE
K. E. McCOY E. E. McCOY
E. E. McCoy & Sons
Telephone 113—P. O. Box 644
Grayville, Illinois

NORTH-CENTRAL TEXAS AREA
Sales and Service
O. B. ALLBRITTON
Globe Sales Company
Telephone 6655
1008 Virginia Street
Wichita Falls, Texas

MISSISSIPPI AND ALABAMA AREA
SALES AND SERVICE
JAKE TIPPS
Tipps Tool Company
Telephone LD-22
P. O. Box 547
Laurel, Mississippi

DOMINION OF CANADA AREA
Sales and Service
O. L. WOOTEN
Rotary Sales and Service, Ltd.
Telephone 3-8980
P. O. Box 4110
Edmonton, Alberta, Canada

EXPORT SALES
HUNT EXPORT COMPANY
Telephone Bowlinggreen 9-7125
New York City, New York

HOUSTON, TEXAS, OFFICE
Telephone FAirfax 7131

More POWER FOR OIL DRILLING AND PUMPING

Built to stand Shock!!!

REPUBLIC TRANSMISSION BELTING

Here's a belt built away above your most rigid specifications . . . a rugged, flexible Republic Super Excelo Oil Country Transmission Belt that's designed to transfer power without slippage . . . a belt that'll handle overloads or sudden shocks without breaking.

Republic Rubber offers you premium Industrial Rubber Products like this at standard prices because for 52 years we've specialized in super-tough oil country equipment.

Republic knows from experience what field men need. Republic builds to specifications more rigid than any other existing set of standards. Get in touch with your local Republic Distributor or write direct immediately for full information regarding this super-tough Transmission Belting and every other kind of hose and belt used on your job.

Remember, if it's made of rubber, Republic builds it—BETTER!!!

INDUSTRIAL RUBBER PRODUCTS BY
REPUBLIC RUBBER DIVISION
Lee Rubber & Tire Corporation
YOUNGSTOWN, OHIO

BUILT FOR INDUSTRIAL POWER NEEDS EVERYWHERE!

CHRYSLER

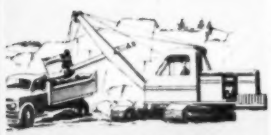
HORSEPOWER WITH A PEDIGREE

Day-in, day-out! . . . developing maximum horsepower with a minimum of down time and at minimum operating cost! That's the outstanding record of Chrysler Industrial Engines on the job!

For Chrysler Industrial Engines are built *solely for industrial use!* They are designed and engineered to meet the *specific working requirements* of each type of equipment they power. Chrysler Industrial Engines can also be adapted to special regional operating conditions.

A letter of inquiry will bring an engineer well qualified to discuss your particular application. Address: **Industrial Engine Division, Chrysler Corporation, Detroit 31, Mich.**

CONSTRUCTION

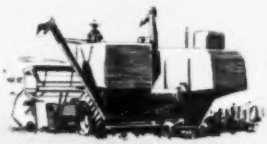


Chrysler Engines Power: Ditching Machines • Cranes • Truck Mixers • Shovels • Loaders • Yarders • Road Pavers • Concrete Mixers • Crane Carriers • Scoop Tractors

INDUSTRY

Chrysler Engines Power: Air Compressors • Pumps • Hoists • Derricks • Tractors • Generators • Arc Welders • Baling Machines • Winches • Conveyors • Tackle Blocks

FARMING



Chrysler Engines Power: Tractors • Combines • Hay Choppers • Gang Mowers • Spreaders • Pumps • Feed Mills • Irrigation Equipment • Orchard Sprayers • Sprinklers

OTHER FIELDS

Chrysler Engines Power: Locomotives • Fire Pumps • Motor Coaches • Drilling Equipment • Pulp Machines • Snow Plows • Oil Well Pumps and Drillers • Street Flushers • Air Conditioning Equipment

HERE'S A GOOD COMBINATION FOR High-Temperature Bolting

When you encounter particularly tough bolting conditions in high-temperature, high-pressure service, use the Bethlehem Continuous-Thread Stud, together with two Bethlehem Quenched Nuts. This combination of fasteners is economical because it resists creep and premature failure induced by high temperatures and pressures, and therefore helps to minimize down-time.

BETHLEHEM CONTINUOUS-THREAD STUD—This stud is ideal for difficult bolting jobs because it minimizes stress concentrations. Has no point of thread runout. Consequently, stresses cannot concentrate at any given point to cause premature failure. Instead, the stresses are well distributed over the entire working length of the stud.

BETHLEHEM QUENCHED NUT—A forged nut, made from high-quality 40-to-50 carbon steel. After forging, the nut undergoes controlled quenching and tempering, arming it with sufficient strength to develop the strength of any stud or bolt on which it is used.

WIDE SIZE RANGE

The Bethlehem Continuous-Thread Stud and the Bethlehem Quenched Nut are made in a wide size range. They make a good combination—one which you can use with complete assurance that it will do the job. Full details from the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Bethlehem supplies every type of Fastener

The Columbia Gas System's Business Is Everybody's Business

That's why we're showing you here a page from our new Annual Report

You can find full details for last year's operations in our 1951 Annual Report. Write The Columbia Gas System, Inc., 120 East 41st Street, New York 17, New York

HIGHER RATES ARE INEVITABLE

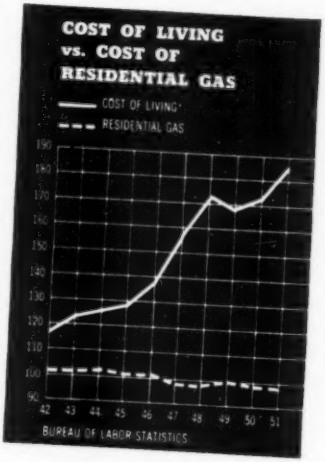
This is just another way of saying that public utility rates have no special immunity from the economic laws governing wages and prices in general industry.

Until recently, Columbia's earnings have continued reasonably satisfactory because of the constant increase in the volume of sales. But now, despite increased operating efficiencies, rising costs of doing business and increased taxes have caught up to us.

The cost of everything we buy—just like the cost of your everyday living—is far higher now than in 1941.

Yet, the cost of gas to our domestic customer has not changed much in all those 10 years.

Look at the chart!



Our customers certainly must appreciate that higher gas rates are inevitable.

If we are to continue high quality service to our customers; if we are to satisfy the demands for more and more gas, we must earn more money. Not enough to put our bills to our customers up to the inflated level of other "cost of living" expenses. But enough so we can meet our obligations as a public service company and protect the investments of our stockholders.

This is the gist of the story we are telling in full detail to the Public Service Commissions which regulate our rates.

We hope that our customers, many of whom are also our stockholders—or, if not ours, stockholders in other public service companies who face the identical problem, realize that higher utility rates are inevitable.

	1951		1950		1949	
	Total	Per Share*	Total	Per Share*	Total	Per Share*
Earnings before taxes	$39,560,932	$2.65	$37,107,503	$2.51	$24,389,467	$1.74
Taxes	22,234,843	1.49	19,579,619**	1.32	12,169,731	0.87
Earnings available to common stockholders	$17,326,089	$1.16	$17,527,884	$1.19	$12,219,736	$0.87

* Based on average number of shares outstanding.
** Includes "special charges" of $3,178,000.

THE COLUMBIA GAS SYSTEM

CHARLESTON GROUP: United Fuel Gas Company, Atlantic Seaboard Corporation, Amere Gas Utilities Company, Virginia Gas Distribution Corporation, Virginia Gas Transmission Corporation, Big Marsh Oil Company, Central Kentucky Natural Gas Company; **COLUMBUS GROUP:** The Ohio Fuel Gas Company; **PITTSBURGH GROUP:** The Manufacturers Light and Heat Company, Binghampton Gas Works, Cumberland and Allegheny Gas Company, Home Gas Company, The Keystone Gas Company, Inc., Natural Gas Company of West Virginia; **OIL GROUP:** The Preston Oil Company.

How TIMKEN® bearings help keep a traveling block from wandering

BREWSTER COMPANY mounts the sheaves of its traveling blocks, crown blocks and hook blocks on Timken bearings to assure maximum stability and long life.

THIS Brewster 250-ton capacity block maintains straight line travel without weaving as it raises and lowers a drilling string. One way Brewster insures this kind of performance is by equipping the block with Timken® tapered roller bearings. Timken bearings keep the block stable because they take radial and thrust loads in any combination —hold sheaves in proper alignment.

Ability to carry heavy drilling strings and take sudden shock loads is assured with Timken bearings. Line contact between rollers and races in Timken bearings provides load carrying capacity to spare, prevents breakdowns on the job.

True rolling motion of Timken bearings plus the smooth surface finish of rollers and races practically eliminate friction. Sheaves turn freely, eliminating cable scuffing. Empty blocks fall faster.

Because Timken bearings keep housing and shaft concentric, closures are more effective. Lubricant stays in—dirt and moisture stay out. Block maintenance is held to a minimum.

No other bearing can give you all the advantages you get with Timken bearings. Make sure you have them in the equipment you buy or build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

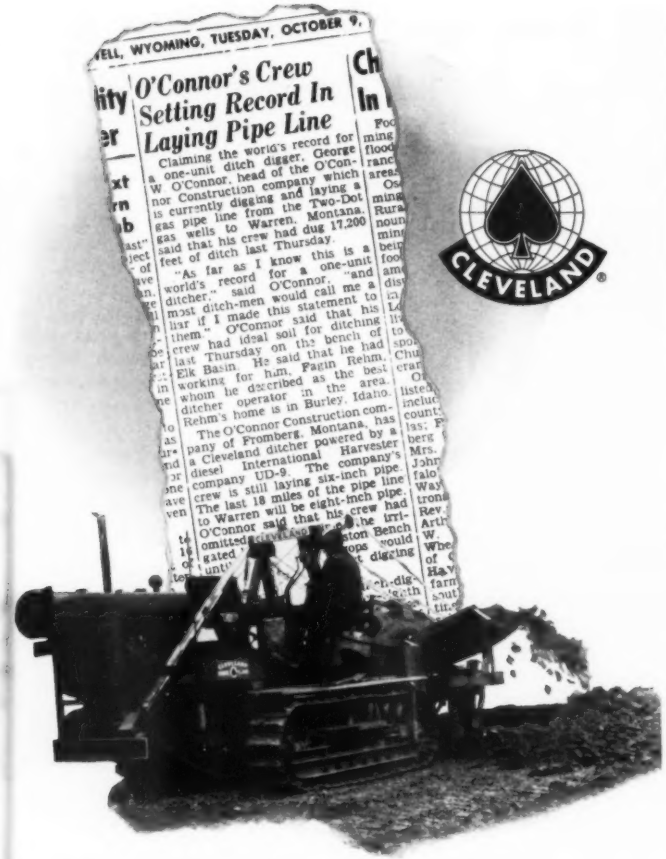
TAPERED ROLLER BEARINGS

FINISHED TO CLOSER TOLERANCES

Finishing to incredible smoothness accounts for much of the precise, smooth rolling performance of Timken bearings. This honing operation is typical of the amazingly accurate manufacturing methods at the Timken Company.

The Timken Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION →◎←


...VELL, WYOMING, TUESDAY, OCTOBER 9,
O'Connor's Crew Setting Record In Laying Pipe Line
Claiming the world's record for a one-unit ditch digger, George W. O'Connor, head of the O'Connor Construction company which is currently digging and laying a gas pipe line from the Two-Dot gas wells to Warren, Montana, said that his crew had dug 17,200 feet of ditch last Thursday.
"As far as I know this is a world's record for a one-unit ditcher," said O'Connor, "and most ditch-men would call me a liar if I made this statement to them." O'Connor said that his crew had ideal soil for ditching last Thursday on the bench of Elk Basin. He said that he had working for him, Fagin Rehm, whom he described as the best ditcher operator in the area. Rehm's home is in Burley, Idaho.
The O'Connor Construction company of Fromberg, Montana, has a Cleveland ditcher powered by a diesel International Harvester company UD-9. The company's crew is still laying six-inch pipe. The last 18 miles of the pipe line to Warren will be eight-inch pipe. O'Connor said that his crew had omitted
gated
CLEVELAND

GEORGE O'CONNOR'S

CLEVELAND DUG 17,200 FEET OF TRENCH IN 9 HOURS

Even under ideal conditions 3¼ miles of 22" x 40" trench in one day is pretty fair digging for a single trencher. Naturally, CLEVELANDS don't set records like this every day. But even when they are digging only 200 feet per day under adverse soil and project conditions you can be sure that CLEVELANDS are performing just as profitably as George O'Connor's did for him. CLEVELAND's wide range of transmission-controlled *combinations of digging wheel and crawler speeds* give you the right speed for every job—just one of the many features which make CLEVELANDS preferred by men who base their judgment on *proved performance.*

See your local distributor. Get the full story on these CLEVELAND features:

√ DEPENDABILITY √ EASE OF OPERATION
√ UNIT-TYPE CONSTRUCTION √ VERSATILITY √ BALANCE
√ WIDE SPEED RANGE √ MANEUVERABILITY

THE CLEVELAND TRENCHER CO.
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

They Say—

Sohio Claim Disputed

Sirs:

The parenthetical statement on Page 106 of The Oil and Gas Journal, February 11, 1952, that "Sohio's twin 18,000-bbl. per day Thermofor cat cracking unit at its No. 1 Cleveland Refinery is a 268-ft. high unit tallest industrial structure in Ohio)" —is incorrect.

The Houdriflow catalytic cracking unit at Sun Oil Co.'s Toledo refinery is 307 ft. high. This plant went on stream March 24, 1950.

Sun Oil Co.
John F. Harron, Superintendent
Toledo, Ohio

Editor Note: Reader Harron's correction is duly noted and recorded. It may be said the oil business is looking up in Ohio.

An Oil Show Is Needed

"It has been a long time between oil expositions in Tulsa. Two wars and sharply increasing costs all along the line have just about destroyed the regularity of the program begun in 1923.

"The proposal for a show in 1953 is good. The industry needs to get together in one place and take a long, hard look at all its component parts. It faces a tremendous job in the next quarter of a century and will have to call on all the science it can hire in exploration, drilling, producing, refining, marketing and banking circles to do it profitably.

"It is at an international exposition such as those held here that this can be done most easily."

Editorial in the Tulsa Tribune.

Oil Is a War Deterrent

"It is no mere coincidence that the trouble areas in the world are rich in oil—Iran, Egypt, Indio-China. A mechanized army runs on oil.

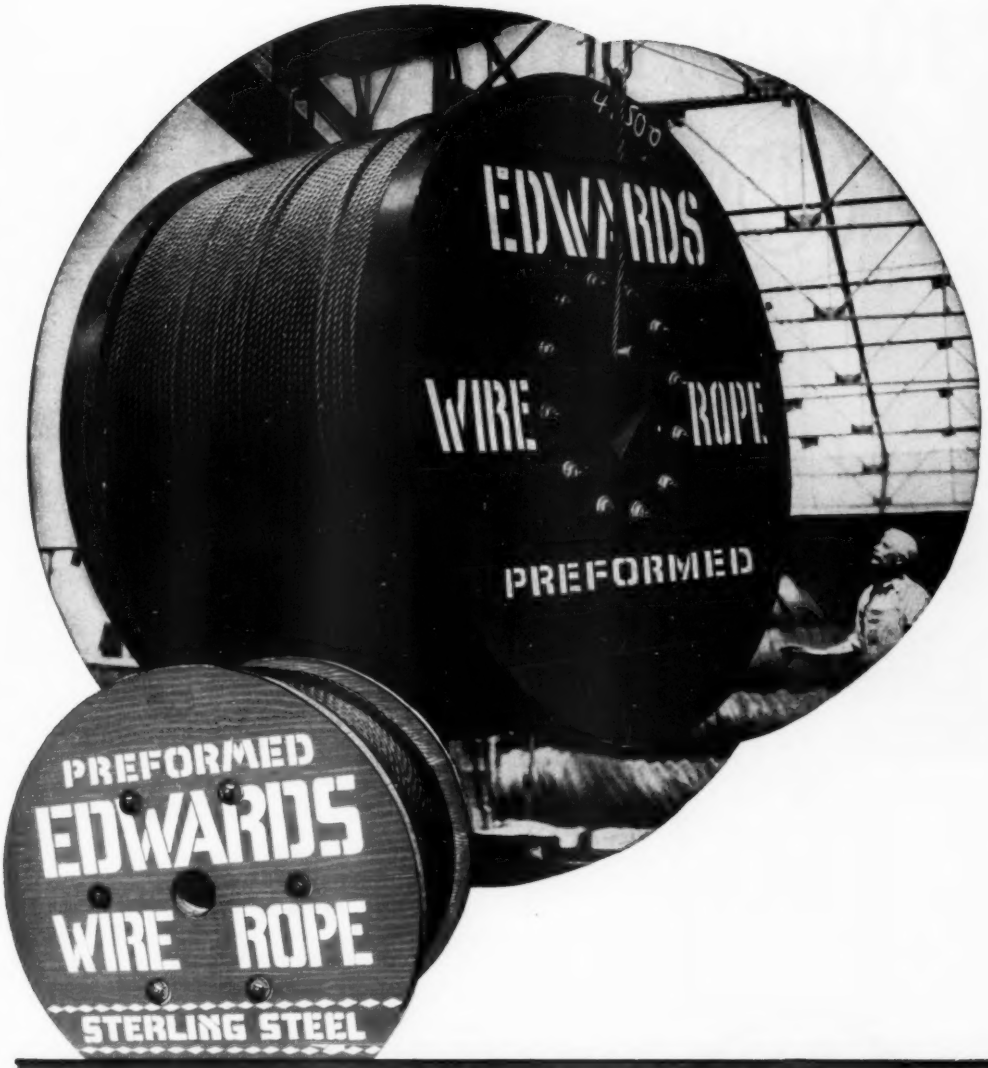
"The great superiority of the free nations' oil industry over that of the Soviet powers' is perhaps as great a deterrent as the atomic bomb in preventing World War III."

Marlin M. Volz, dean of the law school of the University of Kansas City, addressing a church group in Kansas City.

Criticism Unjustified

"As a relatively new, and I trust still open-minded, business executive, I believe that most criticism of big business is based on prejudice, much of which has been deliberately built up by politicians and bureaucrats.

"At the time of the dissolution of



YOU CAN BET YOUR LIFE ON

EDWARDS
WIRE ROPE

Head Office: SAN FRANCISCO • Main Plant: SOUTH SAN FRANCISCO

Branch offices

SEATTLE • PORTLAND • LOS ANGELES • HOUSTON

Distributors throughout the West, Gulf Coast and Mid Continent

STRONG RIG...weak Link

BJ FIXES—

quick as a WINK!

With BJ factory rebuilding you're assured of the correct welding and heat treating techniques—of magnaflux inspection before and after repair—and of the "experience and knowledge of the men who made 'em."

Here's how your field-worn tools are rebuilt the BJ way.

Complete factory overhaul includes—

- Magnaflux inspection to detect hidden cracks.
- The use of carefully selected welding rods to restore the strength and toughness of BJ links in order that they can again withstand the shock loads of deep drilling operations.
- Controlled reheat treatment to restore steel to its original strength.
- And final magnaflux inspection to give you further assurance of the care and supervision that goes into BJ factory rebuilding.

BJ
FACTORY SERVICE
Engineered
OIL TOOL REBUILDING
for safety and long life

Find out more about BJ's oil tool rebuilding service from your jobber or BJ representative today!

The men and machines that made 'em know 'em best!

Byron Jackson Co.

8247 Navigation Blvd., Houston, Texas • Woodcrest 8321

PACIFIC COAST SERVICE

the Standard Oil Trust in 1911, Standard of Indiana was the only large oil company in the Middle West, doing about 80 per cent of the business.

"Over the years we have seen one company after another, both new and old, grow and prosper.

"Today 22 of the companies which compete in this area have assets of over 100 million dollars, and Standard does less than 20 per cent of the business.

"Most, if not all, of the other principal Standard Oil companies have also grown less rapidly than the industry as a whole, and many of the once-small independents have greatly outstripped them in rate of growth."

Dr. Robert E. Wilson, chairman of the board, Standard Oil Co. (Ind.), in a discussion before a Chicago Bar Association meeting.

CALENDAR

March

Illinois Petroleum Marketers Association, annual convention, Hotel Sherman, Chicago, March 11-13.

Texas Oil Jobbers Association, Inc., annual spring convention and refiners and suppliers exhibit, Hotel Adolphus, Dallas, March 12-13.

Petroleum Engineering Management Conference, University of Oklahoma, North Campus, Norman, Okla., March 14-15.

American Institute of Chemical Engineers, regional meeting, Atlanta, March 16-19.

Ohio Petroleum Marketers Association, annual convention and marketing exposition, Deshler-Wallick Hotel, Columbus, Ohio, March 18-20.

American Petroleum Institute, Division of Production, Mid-Continent district meeting, Broadview Hotel, Wichita, Kans., March 19-21.

American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, and Society of Exploration Geophysicists, joint annual meeting, Biltmore Hotel, Los Angeles, March 23-27.

Texas Independent Producers and Royalty Owners Association, sixth annual meeting, Fort Worth, March 27-28.

North Texas Oil and Gas Association, twenty-second annual meeting, Kemp Hotel, Wichita Falls, Tex., March 29.

Western Petroleum Refiners Association, annual meeting, Plaza Hotel, San Antonio, March 31-April 2.

Mid-West Gas Association, annual meeting, Hotel Radisson, Minneapolis, Minn., March 31-April 2.

American Chemical Society, division of petroleum chemistry, annual meeting, Milwaukee, March 31-April 3.

April

Pacific Coast Gas Association, annual transmission conference, Berkeley, Calif., April 2-3.

Oil and Gas Conservation Institute, University of Oklahoma, Norman, Okla., April 2-3.

American Petroleum Institute, Division of Production, eastern district, Hotel William Penn, Pittsburgh, April 2-4.

Florida-Georgia Gas Association, annual convention, Soreno Hotel, Saint Petersburg, April 3-5.

Missouri Liquefied Petroleum Gas Association, Hotel President, Kansas City, Mo., April 7-9.

American Society of Lubrication Engineers, annual meeting, Statler Hotel, Cleveland, April 7-9.

Arizona Geological Society of America,

BARGE FACILITIES at PLS-Harvey, La.

To Serve You Better in the Gulf Coast Area

Located on the Intra-Coastal Canal across the Mississippi River from New Orleans, the modern PLS plant at Harvey provides most complete facilities for handling shipments by water, as well as by rail and truck. Thus, pipe can be shipped direct from the tube mills—cleaned, primed, coated and wrapped—and then re-shipped by barge, rail or truck to points on the Gulf Coast or overseas.

It's another plus in PLS service.

PLS

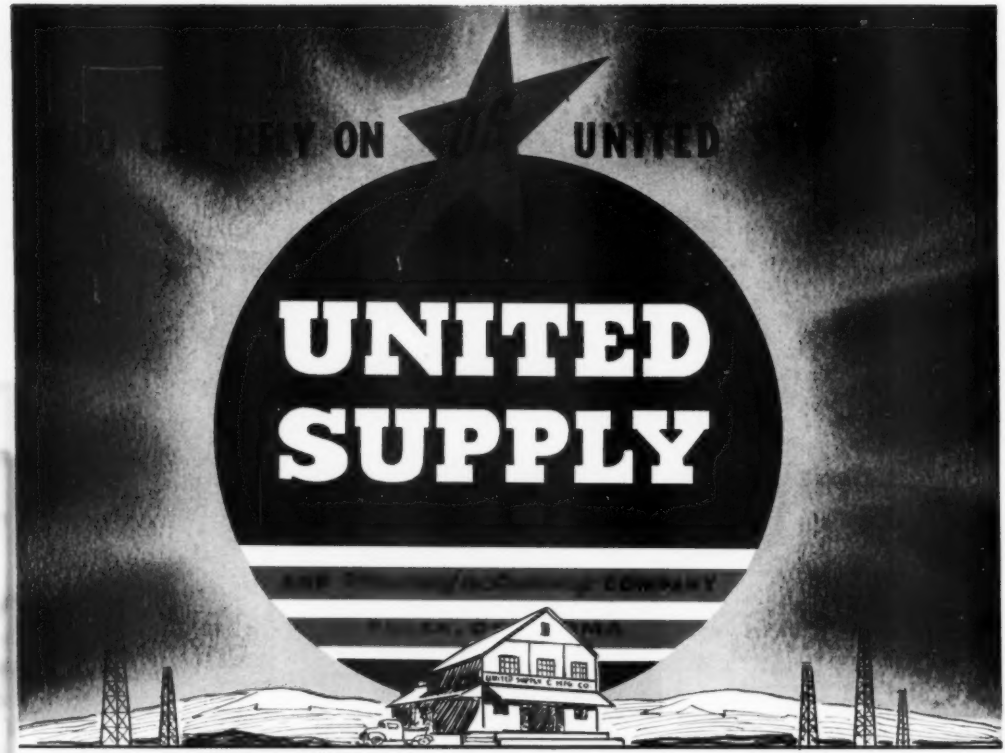
PIPE LINE SERVICE CORPORATION

Pioneers in Steel Pipe Protection

General Offices and Plant: Franklin Park, Illinois

Plants at Glenwillard, Penna.; Longview, Texas; Corpus Christi, Texas; Harvey, La.; Sparrows Point, Md.

20 Years of Dependable Service



FOR FAST, DEPENDABLE SERVICE ON OIL FIELD EQUIPMENT AND SUPPLIES

Whatever your needs are in oilfield supplies
There's one place to get them without useless tries,
Just contact the nearest of our numerous stores
For—midday or midnight—we ne'er "close our doors."

From rig tip to drill bit, betwixt and between,
We carry each item of which drillers dream,
And when down-time's your headache just give us a try;
When Speed can mean Dollars It's "UNITED SUPPLY."

Uncle Sandy Says: *There's more truth than poetry in this!*

YOU CAN RELY ON UNITED SUPPLY

UNITED SUPPLY

UNITED SUPPLY

AND *Manufacturing* COMPANY

TULSA, OKLAHOMA

Stores In: KANSAS, OKLAHOMA, TEXAS, LOUISIANA AND NEW MEXICO

forty-eighth annual meeting, University of Arizona campus, Tucson, Ariz., April 11-12.

Petroleum Industry Electrical Association and Petroleum Electrical Supply Association, twenty-fourth annual joint conference, Mayo Hotel, Tulsa, April 14-17.

American Institute of Electrical Engineers, District 7 meeting, Hotel Jefferson, St. Louis, April 15-17.

Association of American State Geologists, annual meeting, Tallahassee, Fla., April 15-19.

National Petroleum Association, semiannual meeting, Hotel Cleveland, Cleveland, April 16-18.

American Petroleum Institute, Division of Transportation, pipe-line conference, Blackstone Hotel, Fort Worth, April 21-23.

American Petroleum Institute, safety and fire-protection committees, Hotel Texas, Fort Worth, April 21-24.

National Petroleum Council, conference rooms A and B of the Interior Department Auditorium, Washington, D. C., April 22.

American Petroleum Institute, Division of Production, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., April 24-25.

Indiana Gas Association, annual meeting, French Lick Springs Hotel, French Lick, Ind., April 24-25.

Independent Petroleum Association of America, midyear meeting, Deshler-Wallick Hotel, Columbus, Ohio, April 28-29.

American Oil Chemists' Society, spring meeting, Shamrock Hotel, Houston, April 28-30.

American Institute of Electrical Engineers, District 1 meeting, Binghampton N. Y., April 30-May 2.

Natural Gasoline Association of America annual meeting, Rice Hotel, Houston, April 30-May 2.

May

Southeastern Section Geological Society of America, and Southeastern Mineral Symposium, joint meeting, Hotel Roanoke, Roanoke, Va., May 1-3.

National Air Pollution Symposium, Huntington Hotel, Pasadena, Calif., May 5-6.

American Geophysical Union, thirty-third annual meeting, National Academy of Sciences, National Research Council, Washington, D. C., May 5-7.

Interstate Oil Compact Commission, spring meeting, Phoenix, Ariz., May 9-10.

American Institute of Chemical Engineers regional meeting, French Lick, Ind., May 11-14.

American Association of Petroleum Geologists, regional meeting, Mayo Hotel, Tulsa May 12-13.

American Gas Association, Natural Gas Department, spring meeting, Biltmore Hotel Los Angeles, May 12-13.

Annual Liquefied Petroleum Gas Association convention and trade show, Palmer House, Chicago, May 12-14.

American Petroleum Institute, Division of Refining, seventeenth midyear meeting, San Francisco, May 12-15.

Pennsylvania Gas Association, Wernersville, Pa., May 13-15.

American Petroleum Institute, Division of Production, Pacific Coast district, Biltmore Hotel, Los Angeles, May 15-16.

American Petroleum Institute, division of marketing, midyear meeting, Copley Plaza Boston, May 19-20.

Gas Appliance Manufacturers Association annual meeting, Broadmoor Hotel, Colorado Springs, Colo., May 21-23.

American Gas Association, production and chemical conference, Hotel New Yorker New York, May 26-28.

Southwestern Gas Measurement Short Course, University of Oklahoma, Norman May 27-29.

Society of Exploration Geophysicists Gulf Coast regional meeting, Rice Hotel Houston, May 29-30.

Seventh annual short course in gas technology, sponsored by the Southern Gas Association, Texas College of Arts and Industries, Kingsville, Tex., May 29-31.

June

Society of Automotive Engineers, summer meeting, Ambassador and Ritz-Carlton Hotels, Atlantic City, N. J., June 1-6.

Snap-on

SERVES INDUSTRY EVERYWHERE THROUGH THESE 42 FACTORY BRANCH WAREHOUSES

Albany, N. Y., ALbany 4-2971
Atlanta, Ga., LAmar 4031
Baltimore, Md., HOpkins 4666
Boston, Mass., STadium 9-2930
Brooklyn, N. Y., SLocum 6-8707
Buffalo, N. Y., GArfield 6374
Charlotte, N. C., 3-8831
Chicago, Ill., CAlumet 5-6690-91
Cincinnati, Ohio, WOodburn 3188
Cleveland, Ohio, PRospect 4400
Dallas, Texas, Riverside 1611
Denver, Colo., ALpine 5406-07
Detroit, Mich., TRinity 5-6455
Fargo, N. Dakota, 5790
Houston, Texas, FAirfax 2815
Indianapolis, Ind., LIncoln 4351
Jacksonville, Fla., 4-4460, 4-4469
Kansas City, Mo., WEstport 0364
Los Angeles, Calif., DUnkirk 83445
Milwaukee, Wis., WEst 3-3116-17
Minneapolis, Minn., GEneva 5367
Newark, N. J., ESsex 5-3197-98
New Orleans, La., RAymond 2418
New York, N. Y., JErome 7-7523
Oklahoma City, Okla., 3-4975
Omaha, Nebr., JAckson 6159
Philadelphia, Pa., POplar 5-7400-01
Pittsburgh, Pa., MOntrose 7600
Richmond, Va., 2-8115
St. Louis, Mo., NEwstead 1150-51
San Francisco, Calif., UNderhill 3-3195
Seattle, Wash., CApitol 3646
Syracuse, N. Y., 5-2224
Toledo, Ohio, ADams 1026

IN CANADA

Edmonton, Alta., 23889
London, Ont., FAirmount 3078
Moncton, N. B., 2-4159
Montreal, Que., DOllard 4620-29
Regina, Sask., 7170
Toronto, Ont., MAyfair 1196-97
Vancouver, B. C., TAtlow 1561
Winnipeg, Man., 927-707

A complete national tool service
....Engineering
....Manufacture
....Distribution

*Snap-on is the trademark of Snap-on Tools Corporation

SNAP-ON TOOLS CORPORATION, 8098-C 28th Ave., Kenosha, Wisconsin

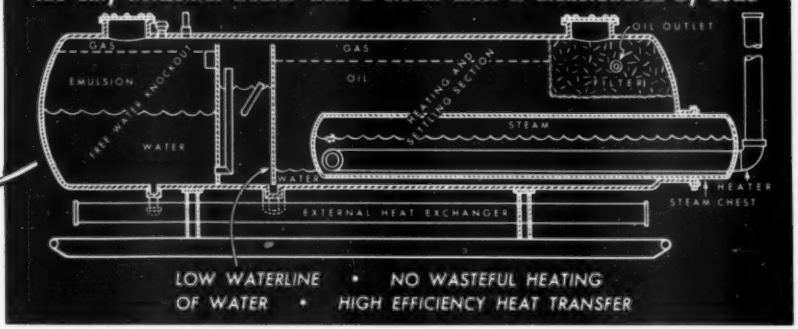
New BS&B Horizontal EMULSION TREATER* Model HGT

with 6 advancements

1. *Absolute minimum of heat loss to water*
2. *Steam chest for direct heating of oil*
3. *Larger oil settling space*
4. *Constant temperature maintained throughout settling section*
5. *No risk of firebox burnouts*
6. *High firebox efficiency*

*PATENTS PENDING

The only horizontal treater with a steam chest is manufactured by BS&B



LARGE QUIET HORIZONTAL FREE WATER KNOCKOUT

Ample to allow rapid settling of free water. Production enters above the gas-emulsion interface, allowing rapid separation of gas and reducing turbulence in the water knockout section. Horizontal flow offers large surface for the separation of free water which is removed without being heated. Oil-water and oil-gas interfaces are controlled by means of fixed weirs.

LARGE STEAM HEATING AND SETTLING SECTION

BS&B design in the new *horizontal* treater provides a lower water level—thus a larger oil heating and settling space—thus ample time for oil and emulsion water to separate. Heating the oil directly with a steam chest instead of the usual hot water bath eliminates wasteful heating of water. Atmospheric heat losses are reduced—evenly maintained temperature of settling section allows lower maximum temperature. A large filter bed in the heating and settling section aids in the final separation of the water and oil.

REMOVABLE STEAM GENERATOR BUILT TO A. S. M. E. CODE REQUIREMENTS

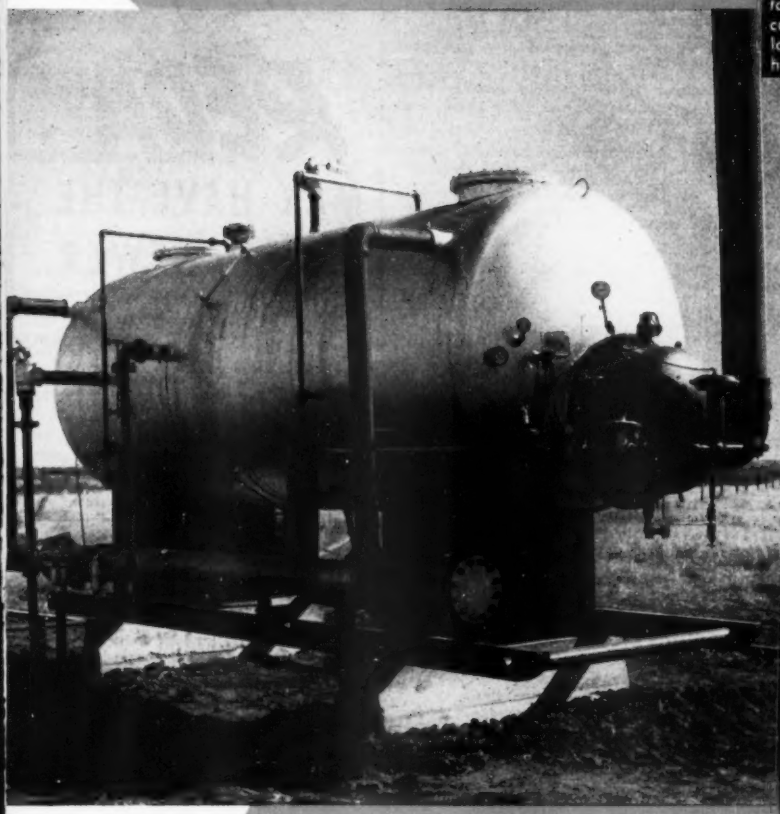
Efficient, safe operation in the new BS&B *horizontal* treater. Employs closed system steam chest requiring no makeup water; has the BS&B High (70%) Thermal Efficiency Firebox. The heating unit is free from sedimentation and caking trouble since the hot surface of the firetube is never in contact with the oil or salt water. Possibilities of burnouts or loss in firebox efficiency is eliminated. The heating unit is balanced with the oil treating capacity of the heater. Heating unit removable, making inspection of heating and settling section easy.

ioneered by BS&B

PORTABLE when skid mounted . . . is particularly popular in cold climates because it's easily housed or insulated.

IN THE *NEW* BS&B *horizontal* treater controls are conveniently grouped and located for piping and housing.

FOR MAINTENANCE, all sections are easily accessible. Each compartment can be drained separately without draining balance of treater.



WATER from free water knockout and settling sections is withdrawn through a single internal siphon from common water compartment. Easy, outside adjustment controls settling section water level.

HIGHER OIL GRAVITY—Primary gas separation is made cool . . . hot gas evolved in heating and settling section is mixed with cool gas causing heavier gas fractions to condense and be recovered in oil.

THE BS&B *HORIZONTAL* treater requires a minimum of hook-up work—requires minimum foundations, especially when purchased with skids.

NOTE: The *new* Black, Sivalls & Bryson *Horizontal* Treating Unit has already been field-tested and proven. These *horizontal* treaters are AVAILABLE FOR DELIVERY. Sizes . . . 6'x14' . . . 6'x21' . . . 8'x21' . . . 10'x21'. Auxiliary units are available for attachment to the treater at the factory or in the field with a minimum of time and cost.

EFFICIENCY BS&B RELIABILITY

In the OIL COUNTRY it's BS&B . . . there's one of our 35 Branches near you . . . or write

BLACK, SIVALLS & BRYSON, INC.

Oil & Gas Equipment Division, Department 1-A3

2131 Westwood Boulevard Oklahoma City, Oklahoma

When you get down to the **FACTS** be sure that you get **ALL the FACTS** for **Reservoir Evaluation**

Get Accurate Data on Porosity and Permeability for Geological, Engineering and Production Departments

The accuracy of pore space computation by the plug method of core analysis is not questioned except where fractures, vugs or other similar phenomena occur. Such conditions are beyond the scope of this phase of analysis. For this reason another technique—Full Diameter Corestudy—has met the challenge successfully from Canada to Mexico in order that your geological, engineering or production departments can have accurate data on porosity and permeability—essential knowledge for reservoir evaluation.

Write for a copy of our new descriptive price list "5 Core Analysis Services." It will enable you to select the best and most economical service for your particular problem.

CHEMICAL & GEOLOGICAL LABORATORIES

P. O. Box 279—Casper, Wyoming
1700 West North Front Avenue
Midland, Texas
10568 - 114th Street
Edmonton, Alberta, Canada

Pennsylvania Grade Crude Oil Association, annual meeting, Hotel William Penn, Pittsburgh, June 5-6.

Canadian Gas Association, Chateau Frontenac, Quebec, June 8-12.

American Petroleum Institute, midyear standardization meeting, Brown Palace Hotel, Denver, June 9-14.

Western Petroleum Refiners Association, regional technical and industrial-relations meeting, Broadview Hotel, Wichita, Kans., June 12-13.

International Gas Conference, Brussels, Belgium, June 16-22.

Kentucky Oil and Gas Association, annual meeting, Hotel Lafayette and Phoenix Hotel, Lexington, Ky., June 19-20.

Petroleum Equipment Suppliers Association, Mark Hopkins Hotel, San Francisco, June 22-25.

Michigan Gas Association, annual meeting, Grand Hotel, Mackinac Island, Mich., June 23-24.

American Society for Testing Materials annual meeting, Hotel Statler, New York June 23-27.

American Institute of Electrical Engineers, summer general meeting, Nicollet Hotel, Minneapolis, Minn., June 23-27.

August

Society of Automotive Engineers, national West Coast meeting, Fairmont Hotel, San Francisco, August 11-13.

American Institute of Electrical Engineers, Pacific general meeting, Westward Ho Hotel, Phoenix, Ariz., August 19-22.

September

Pacific Coast Gas Association, Ambassador Hotel, Los Angeles, September 3-5.

Instrument Society of America, seventh national instrument conference and exhibit, Cleveland, September 8-12.

National Petroleum Association, fiftieth annual meeting, Hotel Traymore, Atlantic City, N. J., September 10-12.

American Institute of Chemical Engineers, regional meeting, Palmer House, Chicago, September 11-13.

Western Petroleum Refiners Association, regional meeting, Hotel Henning, Casper, Wyo., September 25-26.

American Association of Oilwell Drilling Contractors, annual meeting, Skirvin Hotel, Oklahoma City, September 26-30.

October

California Natural Gasoline Association, twenty-seventh annual fall meeting, Ambassador Hotel, Los Angeles, October 9-10.

Texas Mid-Continent Oil and Gas Association, thirty-third annual meeting, Hotel Texas, Fort Worth, October 13-15.

American Institute of Electrical Engineers, fall meeting, New Orleans, October 13-17.

Natural Gasoline Association of America, southern regional meeting, Blackstone Hotel, Tyler, Tex., October 19.

Independent Petroleum Association of America, annual meeting, Mayo Hotel, Tulsa, October 20-21.

American Oil Chemists' Society, fall meeting, Netherlands Plaza Hotel, Cincinnati, October 20-22.

Society of Automotive Engineers, national transportation meeting, Hotel William Penn, Pittsburgh, Pa., October 22-24.

American Gas Association, annual convention, Atlantic City, N. J., October 27-30.

American Gas Association, annual convention, Atlantic City, N. J., October 27-30

NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month, Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club.

PUMPING PROBLEM

REDA

MAY HAVE THE *RIGHT* ANSWER

. . . from ⅓ HP to 240 HP . . . from 20 bbls to 17,000 bbls . . . from 200′ to 10,000′ and more . . . Yes, a REDA may do that pumping job BETTER . . .

Reda Pumps are accepted as original equipment, or replacement equipment, because they produce at a lower cost per barrel of fluid. Whether it's large volumes from shallow depths, or modest volumes from great depths, Reda Pumps provide operating savings.

IMPROVED DESIGN:

Constant research and design improvement are responsible for lengthened operating life; corrosion resistance, low labor cost per barrel of fluid produced.

IMPROVED EFFICIENCY:

Greatly improved overall efficiencies have improved Reda performance as much as 25%; a substantial operating saving.

If you have a pumping problem, our engineering staff is always ready to assist you. Phone or write:

REDA

PUMP COMPANY

BARTLESVILLE, OKLAHOMA

PARKERSBURG

Hyreco

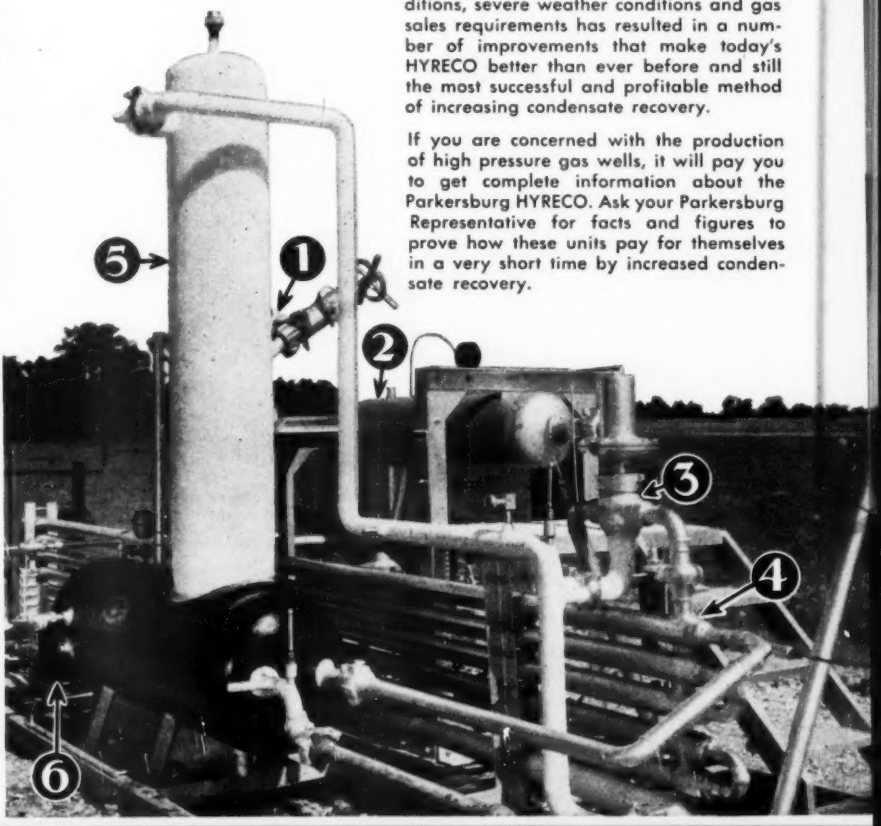
Continuous Improvement Keeps It The Leader In Cold Separation

In mid-1950, after 3 years of field testing, Parkersburg Rig & Reel Company introduced the first commercially successful cold separation unit, the Parkersburg HYRECO. Since then, the HYRECO has been the subject of intensive study by the industry, by Parkersburg, by gas engineers and others interested in increasing condensate recovery from high pressure gas wells.

Parkersburg engineers have carefully checked the performance of every HYRECO put into service. This unrelenting scrutiny of its operation under varying field conditions, severe weather conditions and gas sales requirements has resulted in a number of improvements that make today's HYRECO better than ever before and still the most successful and profitable method of increasing condensate recovery.

If you are concerned with the production of high pressure gas wells, it will pay you to get complete information about the Parkersburg HYRECO. Ask your Parkersburg Representative for facts and figures to prove how these units pay for themselves in a very short time by increased condensate recovery.

1. New inlet deflection arrangement for improved separating capacity.
2. Hydracepter combinations are available for either liquid or water knock-out type of operation, or both.
3. A new and exclusively Parkersburg 3-way valve gives dependable temperature control within the Hydracepter.
4. A completely new series of heat exchangers, properly sized for any given job.
5. New 5000 MCF high recovery separator has 40% greater height to provide greatly increased separating efficiency.
6. All internal parts of Parkersburg's exclusive No-Bleed Liquid Level Controller, except the float, are completely submerged in warm liquid to eliminate cold weather control problems.



5204

PARKERSBURG

PRESSURE EQUIPMENT

HORIZONTAL AND VERTICAL SEPARATORS • HYRECO • HYDRACEPTER • SCRUBBERS • TREATERS • HEATERS

Manufactured in Houston, Texas

THE CARE AND NURSING OF TANK CARS

Use hot water or steam

to open a frozen

outlet nozzle.

Another way to get more from your GATX tank cars

GATX GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South La Salle Street · Chicago 90, Illinois

District Offices: Buffalo • Cleveland • Dallas • Houston • Los Angeles • New Orleans
New York • Pittsburgh • St. Louis • San Francisco • Seattle • Tulsa • Washington

Export Dept.: 10 East 49th Street, New York 17, New York

So many people have requested reprints of these cartoon advertisements that we are making them available to you for use in your shops. Just write us.

THE OIL AND GAS
JOURNAL
TULSA, OKLAHOMA

Published every Monday by The Petroleum Publishing Co., 211 S. Cheyenne, Tulsa, Oklahoma. Founded in 1902. Name changed to The Oil and Gas Journal in 1910 by Patrick C. Boyle

•

P. C. Lauinger, President; S. H. Rourke, Executive Vice President; Mitchell Tucker, Vice President and Advertising Manager; Hanson B. Pigman, Circulation Manager; Donald W. Wilson, Manager, Industry Census Department; J. Parker Holland, Production Manager.

EDITORIAL STAFF

C. O. Willson, **Editor;** Kenneth B. Barnes, **Managing Editor;** Henry D. Ralph, **News Editor;** George H. Weber, **Refining Editor,** 500 Fifth Avenue, New York; Dahl M. Duff, **International Editor,** 500 Fifth Avenue, New York; Gerald L. Farrar, **Engineering Editor;** Paul Reed, **Pipe-Line Editor;** W. L. Nelson, **Technical Editor.**

Associate Editors: Lynn M. Nichols, Neil Williams, R. B. Tuttle, Philip C. Ingalls, and John C. Casper.

District Editors: TULSA: Ted A. Armstrong, Joseph A. Kornfeld, John C. Reidel, William P. Sterne, and Robert J. Enright. HOUSTON, Sterling Building: Walter Rose and F. Lawrence Resen. LOS ANGELES, 650 South Grand Avenue: D. H. Stormont. DALLAS, Mercantile Bank Building: Carl F. Hoot. WASHINGTON, D. C., 621 Albee Building: Bertram F. Linz. MIDLAND, TEX., McClintic Building: Roy F. Carlson. CHATHAM, ONT., 35 Stanley: Victor Lauriston.

Editorial Assistants: Connie Farrar, Tulsa; Martha Allbright, Tulsa, and Lucy Dee Owen, Houston.

Correspondents at Denver, Pittsburgh, Calgary, Columbus, Ashland, Ky., Oil City, Pa., and Mount Pleasant, Mich.

Advertising Offices: TULSA: John D. Reilly, Mid-Continent Manager, 211 South Cheyenne; NEW YORK: Charles A. Wardley, Eastern Manager, and Robert N. Caird, Jr., Representative, 500 Fifth Avenue, Phone LOngacre 4-1750; CHICAGO: C. R. Farmer, Manager, and E. S. Klappenbach, Representative, 105 West Madison Avenue, Phone Central 6-2537; PITTSBURGH: Alfred M. Jones, Manager, 429 Fourth Avenue, Phone Atlantic 1-4835; HOUSTON: John M. Spears, Gulf Coast Manager, Sterling Building, Phone Charter 4626; LOS ANGELES: Donald O. Hanson, Manager, 650 South Grand Avenue, Phone Vandike 0722; ENGLAND: Harry Becker, European Representative, 111 Thorley Lane, Timperley, Cheshire, Phone Ringway 4702.

•

Subscription rate to the petroleum industry, United States and foreign, 1 year, $4.00. Single copies, 50 cents. Back copies when over a year old, one dollar. Note: Payments from outside the U.S.A. may be in the form of an international money order or check on a U.S.A. bank. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1952 by The Petroleum Publishing Co.

Member
ABC Audit Bureau of Circulations
Associated Business Papers
ABP

JOURNALLY Speaking

From Bad to Verse

OUR Reader Service Department never makes a mistake (it says here) but the letter shop which handles the bulk mailings can't boast of such infallibility.

Couple of weeks ago the R.S.D. prepared a very fancy letter to drum up sales of our technical manuals, reprints, maps, and charts, and referred to "the enclosed price list." Only hitch was that the mailer forgot to enclose the list. The letter was signed by Angela Walsh of the Reader Service Department, and before long Angela began hearing from people who asked, in varying tones of amusement or impatience, why the list was not included.

Angela stood it pretty well for a while, but she popped a fuse when C. Robert Leach of San Francisco wrote her as follows:

Oh Angela, dear Angela, your letter
is a pip!
The layout, copy, and color scheme
give it a lot of zip.
The Journal's reprints, charts and
maps
Are vital to all petroleum chaps.
Your letter is true . . . the price is
right
And I'd like to read them every
night.
The reply envelope and order blanks
Were with your letter, so many
thanks.
But, Angela, this I just can't resist—
I'm unable to order . . . You forgot
the list!

It really wasn't Angela's mistake, but our girl is not one to shirk responsibility. She sat right down and wrote Mr. C. Robert Leach this reply:

Oh Robert, dear, I greatly fear
You've caught me in a bind.
My face is red because you said
The list you couldn't find.
For this I must apologize
(Like Washington, I can't tell lies).
I made a bust, but you, I trust,
Will take it in good grace.
I'm mailing you (and others, too)
The list to save my face.
So, Mr. Leach, next time you reach
Into one of my mailings,
The envelope will not, I hope,
Reveal Angela's failings.

Let's stop this thing right here. Angela's a cute blonde, but she's sporting a big diamond, so the rest of you boys can't expect to get any valentines from her no matter what kind of poetry you send in.

Add Poesy Dept.

IT must be the prematurely spring weather, or maybe it's a psychological reaction against the critical world situation, but anyway on the same day that Angela engaged in the poetic exchange chronicled above, our own fan mail contained a letter from Vic Morgan, of Ambridge, Pa., in which he said that the inevitable conclusion to be drawn from the mortality statistics in this Department February 18 is that

Lives of great men all remind us
We are getting old and gray,
And a few short years shall find us
Every bit as dead as they.

Fast Like a Snail

WE can't resist taking a dig at the federal Government for the way it handled the PAD report on petroleum transportation. Early in 1951 the oil-industry men attached to PAD decided they could do a more intelligent job of allocating steel if they had a working schedule of the pipe lines, tank cars, and other facilities needed during the coming 2 years. So they drew one up with the speed and efficiency customary in the industry, and it was mimeographed and was being used early last summer.

But did the industry know about it? Oh, no. A dozen different federal agencies had to "clear" it, coordinate it, edit it, and shuffle it back and forth for 3 or 4 months. Then it was decided to print it as a plush job with the maps and charts redrawn to make them fancier, and that took another 3 months.

Finally, at the very end of February, the industry got a peek at a very beautiful brochure announcing the program for construction during a 2-year period which is more than half gone. And yet there are people who think that the Government can do things more efficiently than private industry.

—*Henry D. Ralph*

A little goes a long way!

Drill with

DRISCOSE*

One pound . . . or even as little as *half a pound* of Driscose to a barrel of mud . . . gives excellent results! That means that only five to ten bags are required for a 500-barrel mud system!

Because there are no fermentation problems with Driscose, no inhibitors are necessary. Less weighting materials needed, means reduced storage and inventory requirements. You use less cement for casing strings because Driscose minimizes channeling. And very little "make-up" Driscose is needed to maintain low fluid loss over a period of weeks.

Order Driscose through your regular mud dealer. Packed in easy-to-handle-and-store, 50-pound, 6-ply, water-resistant bags. No special handling necessary. Add Driscose through regular hopper. Soluble in hot or cold water.

*DRISCOSE is a trademark for Sodium Carboxymethylcellulose

DRILLING SPECIALTIES COMPANY

BARTLESVILLE, OKLAHOMA

THE OIL AND GAS
JOURNAL
Vol. 50, No. 44

CONTENTS FOR MARCH 10, 1952

NEXT WEEK

• **The Annual Refining Number.** This traditional issue will feature a two-color section on nearly two score of the principal refining processes, plus a special two-color section on corrosion in the refinery and how to combat it. In addition, there will be numerous articles on corrosion specially prepared by engineers and technologists, each treating some definite phase of corrosion, and means of reducing the losses it causes.

REGULAR DEPARTMENTS

They Say 46
Calendar of Events 49
Journally Speaking 57
Editorial 61
This Week 62
Watching Washington 74
International News 80
Personals 83
Deaths in the Industry 85
Questions on Technology 129
Refiner's Notebook 133
Pipe-Line Construction 135
Oil and Gas Equipment Digest 141
Natural-Gas News 145
Natural-Gasoline News 145
Pipe-Line News 147
Refining News 151
Drilling Contractors 155
Report on Active Rotary Rigs 156
Exploration Statistics 176
Production Statistics 177
Refining Statistics 178
Market Statistics 179
Equipment Men in News 181
Classified Advertising 183
Advertisers' Index 187

EXPLORATION—DEVELOPMENT

From Williston to the Rio Grande 159
Highlights of Week 159
Reports by Areas 160

NEWS FEATURES

PAD's Report, "Transportation of Oil," Is Termed "First Adequate Study" 63
Supply and demand are both rising; 12 per cent gain in demand predicted in 1950-52 period, jump of 23 per cent between 1950-55. PAD sets 1955 MER for all U. S. fields at 7,523,200 bbl. per day. Nation's refining capacity will reach 8,550,000 bbl. by end of 1955, an increase of 1,619,000 bbl. over 1950. Total tank-car requirements fixed at 10,900 in 1952. Pipe-line tankage needs cited.

Oil Men Optimistic That Nation-Wide Strike Can Be Avoided 69
But if it should develop, they feel it won't last long and will have but little effect on ability of industry to continue to meet the nation's demands.

New Field Opened for Oil 70
Ammonia producers are changing to petroleum gases as source material.

A.P.I. Members Discuss Various Production Topics at Shreveport Meeting 71

Work on Tidelands Development Resumed 72
Eleven drilling permits granted by Interior Department for wells, but "only in interest of conservation."

Tidelands Legislation Goes to Senate 73

Operators Warned That Steel Applications Must Get to PAD Earlier 73

Permian Sulfur Plants Turning Out 250 Long Tons Daily; More Building 76

El Paso Natural to Use Gas Turbines as Prime Movers 78

Higher Allowables Indicate March Production of 6,420,000 Bbl. Daily 78

I.P.A.A. Requests Hike in Crude-Oil Price From OPS 79
Association says price of crude should be increased to average minimum of $2.98 per barrel this year, $3.28 per barrel in 1953.

New Venezuelan Gas System to Move Fuel to Puerto La Cruz 80

Mexico Plans to Drill 450 New Wells This Year, a 60 Per Cent Rise 81

Hopes High That Iran, Britain May Reach Temporary Settlement 81

Syria, Lebanon to Grant Equal Pipe-Line Facilities 82

ENGINEERING - OPERATING FEATURES

On-the-Job . . . In the Fields 86-87
Pan Am Southern's "Model Fluid Cat Cracker," Skelly Oil's "Underground Float Gage," New Mexico Asphalt & Refining's "Novel Steam Headers."

On-the-Job . . . In the Fields 88-89
"Photo Tour of San Juan Basin," Humble Oil & Refining's "New Gathering System."

Residual Hydrogenolysis Vs. Coal Hydrogenation 90
Production of synthetic liquid fuels from petroleum found to be more economical. By Alfred Clark and W. C. Lanning, Phillips Petroleum Co.

Hydrocarbon Extraction by Refrigeration 95
Better pipe lining and greater recovery of liquid products are results of Tennessee Gas Transmission's new plant. By J. J. King and R. V. Mertz.

Oil-Base Drilling Fluids 102
Use of proper drilling fluid may be difference between dry hole and substantial producer. By George Miller, Oil Base, Inc.

How to Prevent Breaks in Pipe-Line River Crossings 108
Considerably different practices, backed by thorough engineering analysis, proposed to alleviate this problem. By P. H. Timothy, Southern Natural Gas Co.

"Winterizing" Natural-Gasoline-Plant Operation 115
Special design procedures are necessary where temperatures may reach 0° F. or lower for long periods of time. By Henry N. Wade, Stearns-Roger Manufacturing Co.

A.A.P.G. Digests 125
Papers presented at Rocky Mountain section meeting, Salt Lake City, February 28-29, 1952.

Questions on Technology—Yields in Viscosity Breaking, Part 1 129

Anton-Irish Field Starts Gas Injection 130
Another unitization and secondary-recovery project put into operation. By engineers of Stanolind Oil & Gas Co.

Refiner's Notebook—Back Pressure Relief Valve 133

Oil and Gas Equipment Digest 141

here's the plug

proved best by thousands of runs

Truth of the saying "Nothing succeeds like success" is outstandingly proved by the BAKER RETAINER BRIDGE PLUG! The "well proved" design—based upon the long famous Baker Cement Retainer—has performed successfully in countless thousands of wells—for every purpose—at all temperatures—and at all depths.

IDEAL FOR EVERY PURPOSE

For new well completions, work-overs, testing, squeeze jobs, well abandonments, and many other installations, you can be sure of fast, efficient, economical results with the Baker Model "K" Retainer Bridge Plug—Product No. 400.

The design of the plug affords ample clearance for fast, safe running-in, and the slips set quickly and positively. The packing element is held in sealing position by lead seals; packs off against all differential pressures; and prevents movement of fluid or gas either up or down the well. There is no need to place cement above the Baker Retainer Bridge Plug to effect a perfect seal, but, if desired, you can dump cement *on the same run* by using a Baker Model "B" Dump Bailer.

YOUR CHOICE OF TWO EASILY DRILLABLE TYPES

For temporary service, choose the Baker MAGNESIUM ALLOY Type Bridge Plug; for permanent installations, specify the CAST IRON Type which is stronger than the casing, and will outlast the casing if harmful well fluids are a problem. Either type drills up in record time because the drilling bit contacts the *very minimum* cross-sectional area; the *short over-all length* reduces drilling time; and the *segmented cast iron slips* are quickly broken up with cable tools, or a rotary bit.

CHOOSE YOUR SETTING METHOD

A BAKER BRIDGE PLUG (Product No. 400) can be set on tubing or drill pipe (in the same manner as the well known Baker Cement Retainer) but in these days of pipe shortages we suggest that you contact your choice of the leading wire line service organizations for setting a Baker Bridge Plug (Product No. 400-D) on an electrical conductor cable. You can thus avoid wear and tear on your tubing, and worthwhile savings of time result from wire line setting, particularly in deeper wells.

ARE YOU USING THE BAKER ADVISORY SERVICE?

Why not call the Baker representative in your area and discuss with him installation of a Baker Bridge Plug? You will find that he has valuable knowledge and helpful suggestions to solve your problems.

BAKER OIL TOOLS, INC.

HOUSTON • LOS ANGELES • NEW YORK

BAKER

RETAINER BRIDGE PLUG

When oil men look ahead they see oil everywhere

TWO studies on the future of oil have been issued within the last 10 days and both of them predict that there will be plenty of oil for this country, and for the world, during the next few years and as far into the future as anyone cares to peer.

Both were prepared by oil men serving by assignment on governmental agencies, so both reports have official standing and the authenticity of practical specialists. Both are well documented and carefully reasoned.

The availability report of the National Petroleum Council outlines, within upper and lower ranges of reasonable expectancy, the volumes of petroleum the world's consumers can count on getting from major areas through 1955. It goes on to predict that the availability of oil will continue to increase for another generation or two. Not even a hint of possible oil shortage appears anywhere in the report.

The transportation report of the Petroleum Administration for Defense, concerned with the United States only, goes into more specific detail as to 1955 supply and demand, by products and areas, and outlines the new facilities which will be needed. It, too, contains no shadow of doubt that the supplies and facilities will be available when needed.

IS such optimism merely whistling in the dark? Far from it. Oil men are traditionally optimistic, but their optimism is soundly based on the successful accomplishments of the past. They know they can find and deliver as much oil as is needed because they have always done so before and because the methods by which they did it are still good.

Oil consumers have been served well by this optimism. And as long as this sort of optimism continues they can feel confident that there will be plenty of oil whenever and wherever they need it. The oil men can't predict precisely where they will find this future oil, but whenever they look ahead they see plenty of places to hunt for it.

THERE is just one condition pinned to the oil man's promise to meet all future demands: The people who want the oil must make it worth while for somebody to go after it.

Finding oil isn't easy; it takes a lot of work and a lot of money. And if the game isn't worth the candle—both in personal satisfaction and in coin—nobody is going to exert himself or risk his capital to try to find oil.

The price the public must pay to get plenty of oil in the future is not high in dollars, for there is little reason to expect that the cost of petroleum products will go up much in relation to other commodities. The price is simply the maintaining of economic and political conditions under which an oil man can hope for a reasonable return on his money and live a respectable and respected life while trying to get it.

THIS WEEK

IT'S STILL WINTER.—Spring may be just around the corner, but surveying for seismic operations in the Rocky Mountains still is something less than a sporting proposition. Blizzards such as the one which dumped the snow in the background may slow down the search for oil, but they don't halt it. Here Vernon Coley, with a Cities Service Co. seismic crew, makes notes as the crew works an area near Lewiston, Mont.

STRIKE—Chances are waning that there will be a nation-wide petroleum-industry strike. . . . Government not expected to allow it because a shutdown of refineries, production facilities, or gas-transmission lines would play havoc with the defense program. . . . This new turn is reflected in the market situation. Rush to get products from refineries into secondary storage has lost its urgency. . . . Administration officials are determined to prevent the strike if possible. . . .

STEEL—If operators want steel for new oil pipe lines and storage tanks, they'd better file applications further in advance of the start of construction, or they won't get the material, PAD warns. . . . Many "seem unaware that steel continues in tight supply," PAD head says. . . . Unless PAD can substantiate its claims the industry is going to be given less steel than it really needs. . . . ¶Cold-drawn and hot-rolled carbon-steel bars added to the list of "most critical" materials. . . . ¶T.I.P.R.O. wants steel mills to make accounting of all oil-country tubular-goods milled in last half of 1951. . . .

TIDELANDS—Development work resumed in the tidelands area off Louisiana's coast. . . . Operators, wanting to get some return on their heavy investments in idle equipment, have received a total of 11 drilling permits from the Interior Department. . . . But Interior claims these permits were O.K.'d "in interest of conservation" only. . . . ¶More wrangling is in store for the proposed tidelands legislation now before the Senate. . . .

TRANSPORTATION—Industry hails PAD transportation report as "first adequate study ever made." . . . Both supply and demand are rising and will continue to do so, agency predicts. . . . 1955 MER for all U. S. fields set at 7,523,200 bbl. daily. This compares with 1950 output of 5,402,300 bbl. . . . ¶Refining capacity will reach 8,550,000 bbl. by end of 1955. . . . ¶Tank-car requirements fixed at 10,900 units this year. . . . ¶Projects for 1951-52 should total 4,400 miles of products pipe lines to handle increasing demands. . . . ¶Product-storage increase of 85,200,000 bbl. urged. . . .

SULFUR—Refiners and others who use more than 20 short tons of sulfur or sulfuric acid monthly must submit monthly reports showing receipts, end-use, and inventories to NPA before the fifteenth of each month. . . . December 1951, January 1952 reports due now. . . . ¶New Permian basin sulfur plants will soon turn out 250 long tons daily. . . .

PRICES—I.P.A.A. asks OPS to grant price increase for crude. . . . A higher return is essential if anticipated expansion program is to be carried out, association warns. . . . Increase to average minimum of $2.98 per barrel this year and $3.28 per barrel in 1953, with higher levels in event of increased costs and higher taxes, urged. . . . ¶I.P.A.A. says there has been no over-all general increase in petroleum prices since 1947 and that oil prices have not contributed to inflationary trend since outbreak of Korean fighting. . . .

ACTIVITY—Production of crude and lease condensate averaged 6,362,400 bbl. daily for the week ended March 1, down 2,075 bbl. daily. . . . ¶Total completions for the week increased 34 wells to 869. . . . Wildcat completions totaled 196 compared with 164 for the previous week and 185 for the same week in 1951. . . . ¶Rotary rigs operating in the United States on March 3 decreased 36 rigs for the week to 2,664. . . .

TRENDS—Under influence of the strike threat, refinery runs set a new all-time record of 6,816,000 bbl. daily for the week ended March 1. . . . ¶Net reduction in primary stocks for the week was 3,200,000 bbl. . . . ¶Some Mid-Continent refiners report decrease in product movement for the first week of March. . . .

"First Adequate Study"

OIL men this week are studying a 118-page report on "Transportation of Oil", prepared by the Petroleum Administration for Defense as a handbook of the industry's needs for transportation and storage facilities.

It is called the first adequate study ever published of transportation available to the oil industry, and in addition it forecasts specific needs for 1952 and probable requirements through 1955.

PAD started with detailed studies of availability of crude oil and natural-gas liquids, refining capacity, and market demand, by areas. Using these forecasts as a basis, the agency then computed the kinds and locations of pipe lines, barges, tank cars, and other facilities needed to keep all segments of the industry in balance and to maintain a steady flow of products to consumers.

On this and the following five pages The Oil and Gas Journal presents a summary of the most significant data of this important book, beginning with the studies on which the group based all its estimates of transportation needs.

Supply, Demand Rising

PAD division predicts 12 per cent gain in demand during 1950-52 period, jump of 23 per cent in period 1950-55

TOTAL demand for crude and petroleum products, including military and export demands, will climb to about 8,383,000 bbl. daily by 1955, according to the PAD transportation report.

This estimate is a part of a demand forecast used as a basis in determining the adequacy of oil transportation and the requirements under a defense economy during the next 3 years.

The demand forecast calls for an increase of 820,000 bbl. daily or 12 per cent for the 1950-1952 period and a gain of 1,580,000 bbl. daily or 23 per cent between 1950 and 1955. Additional transportation facilities will be required to meet these higher demands.

Table 1 shows supply and demand balances for the years 1950, 1952, and 1955. Domestic demand in 1955 is estimated at 8,178,000 bbl. daily, an increase over 1950 of 1,679,000 bbl. daily or 25.8 per cent. For the same period, exports of crude and products are expected to decrease 99,000 bbl. daily or 32.6 per cent.

On the supply side, the increase in crude production for the 5-year period is set at 19.6 per cent compared with a gain of 46.2 per cent for natural-gas liquids. The largest relative gain is forecast for crude imports, up 49.7 per cent. The increase in product imports is estimated at 29.2 per cent.

Table 2 shows total demands by districts and by major products. District totals include demands within the district plus exports to foreign countries, but do not include crude or product sales for shipment to other districts.

For the 5-year period, the greatest volumetric gain in demand is forecast for District 1, up 615,000 bbl. daily. The largest relative gain is expected in District 3, up 36.0 per cent.

For the 1950-1955 period, demand for distillate fuels is expected to increase more than for any other major product. From an average of 1,116,000 bbl. daily in 1950, distillate demand is projected at 1,477,000 bbl. daily for 1955, an increase of 32.3 per cent. The largest increase in volume is forecast for gasoline, up 806,000 bbl. daily for the 5-year period. Kerosine demand is expected to increase 19.1 per cent and residual fuel 14.7 per cent.

TABLE 1—SUPPLY AND DEMAND
(Thousands of barrels daily)

	1950	1952	1955
Estimated demand:			
Domestic demand (Including military)	6,499	7,383	8,178
Exports:			
Crude	95	55	40
Products	209	185	165
Total demand	6,803	7,623	8,383
Indicated supply:			
Domestic production			
Crude	5,402	5,997	6,461
Natural-gas liquids	498	631	728
Imports:			
Crude	487	560	729
Products	360	435	465
Stock changes	—56	....	....
Total supply	6,803	7,623	8,383
Refinery runs	5,739	6,429	7,073

TABLE 2—U. S. TOTAL DEMAND, INCLUDING EXPORTS—1950 ACTUAL, 1951-1955 PROJECTED
(Thousands of barrels daily)

	1950	1951	1952	1953	1954	1955
Total U. S.:						
Gasoline	2,792	3,088	3,343	3,365	3,486	3,598
Kerosine	329	342	355	368	380	392
Distillate	1,116	1,222	1,286	1,355	1,416	1,477
Residual	1,559	1,630	1,689	1,727	1,756	1,788
Other	1,007	1,028	1,050	1,068	1,103	1,128
Total	6,803	7,310	7,623	7,883	8,141	8,383
District 1:						
Gasoline	939	1,018	1,077	1,120	1,155	1,182
Kerosine	172	176	182	188	193	197
Distillate	545	595	631	666	700	731
Residual	718	737	765	785	805	825
Other	186	209	216	226	236	240
Total	2,560	2,735	2,871	2,985	3,089	3,175
District 2:						
Gasoline	1,029	1,114	1,157	1,193	1,222	1,247
Kerosine	116	113	117	122	127	133
Distillate	334	380	397	417	434	451
Residual	249	262	268	269	271	275
Other	298	306	301	289	296	302
Total	2,026	2,175	2,240	2,290	2,350	2,408
District 3:						
Gasoline	365	440	476	502	545	593
Kerosine	25	40	43	45	47	49
Distillate	72	81	87	96	104	113
Residual	220	240	253	262	265	269
Other	350	329	343	359	369	380
Total	1,032	1,130	1,202	1,264	1,330	1,404
District 4:						
Gasoline	83	91	97	101	110	116
Kerosine	5	3	3	3	3	3
Distillate	32	33	35	37	40	42
Residual	37	32	32	33	34	35
Other	29	30	32	34	35	36
Total	186	189	199	208	222	232
District 5:						
Gasoline	376	425	436	449	454	460
Kerosine	11	10	10	10	10	10
Distillate	133	133	136	139	138	140
Residual	336	359	371	378	381	384
Other	143	154	158	160	167	170
Total	999	1,081	1,111	1,136	1,150	1,164

Availability Forecast

PAD sets 1955 MER for all U. S. fields at 7,523,200 bbl. per day, compared with 1950 production of 5,402,300 bbl.

UNITED STATES oil fields, operating at their maximum efficient rate of production, will have a crude-oil producibility in 1955 of 7,523,200 bbl. daily, in the opinion of the transportation division of the Petroleum Administration for Defense.

This compares with an estimated producibility in 1951 of 6,783,600 bbl. daily and an actual 1950 production of 5,402,300 bbl. per day.

Natural-gas liquids, the report predicts, will show an even greater relative increase in producibility through 1955, climbing to 728,400 bbl. per day compared with an estimated 1951 availability of 577,200 bbl. and a 1950 production of 497,400 bbl. per day.

The forecast was based on the following assumptions:

1. Demand, price, and cost factors will be such that there will be an incentive comparable to that existing in the years just preceding 1951.
2. Materials will be available to do at least as much drilling as was done in 1950.
3. There will be access to offshore tideland areas for exploration and development, particularly in the Louisiana Gulf.
4. Transportation facilities will be expanded so that inability to reach the market will not constitute a deterrent to growth.

"Important deviations from these basic assumptions," the report says, "would require a revaluation of the estimated availability of crude petroleum."

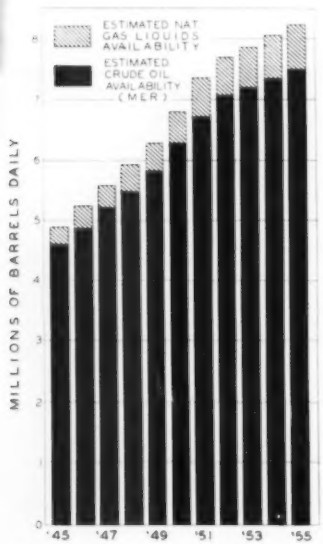
This, in turn, it says, "would significantly change much of this analysis of transportation facilities, refining capacity, and even market requirements."

Neither the crude-oil nor gas-liquids estimates includes estimates of availability of Naval Reserve No. 1 in California, for which the division set 1955 crude producibility at 90,000 bbl. and gas-liquids availability at 7,000 bbl. daily.

In connection with its gas-liquids availability forecast, the division said that the anticipated continued growth in production of liquefied petroleum gas is "at a rate in excess of the increase in natural-gasoline production."

"Increases in L.P.G. production represent a significant part of the total increases in the output of natural-gas liquids," the report says, "and it is generally recognized that L.P.G. production could be further increased by a substantial extent if the demand and price conditions were such as to provide the necessary incentive."

Estimated Availability

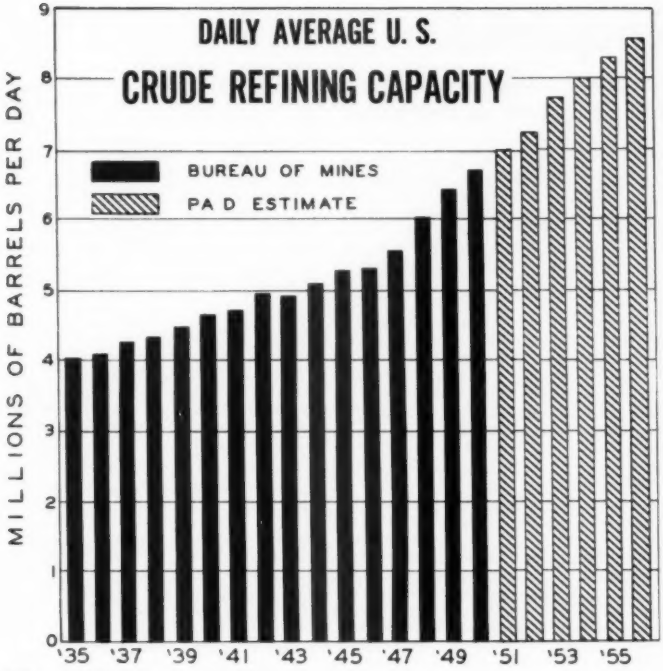


ESTIMATED AVAILABILITY OF CRUDE PETROLEUM IN THE UNITED STATES, 1951-1955
(Thousands of barrels daily)

District, State, and area	Production 1950	Estimated availability 1951	1952	1953	1954	1955
N. Y., Pa., Va., W. Va.	51.4	50.5	47.5	44.5	41.5	39.5
Florida	1.3	1.5	1.5	1.5	2.5	3.5
PAD District 1	52.7	52.0	49.0	46.0	44.0	43.0
Illinois	169.7	162.0	160.0	157.0	153.0	149.0
Indiana	27.2	27.5	27.5	27.0	26.5	25.5
Kansas	294.8	306.0	310.0	313.0	315.0	317.0
Kentucky	28.2	28.5	28.0	27.5	27.0	26.5
Michigan	43.3	39.5	37.5	36.0	34.5	33.5
Nebraska	4.2	13.0	20.0	25.0	28.0	30.0
Ohio	9.1	8.7	8.4	8.1	7.8	7.5
Oklahoma	451.8	517.0	540.0	565.0	580.0	600.0
Missouri and Tennessee	.2	.2	.2	.2	.2	.2
PAD District 2	1,028.5	1,102.4	1,131.6	1,158.8	1,172.0	1,189.2
Alabama	2.0	4.0	6.0	9.0	12.0	16.0
Arkansas	85.5	86.0	87.0	88.0	88.0	87.0
Louisiana	572.9	670.0	730.0	770.0	795.0	820.0
Gulf	451.7	550.0	610.0	650.0	675.0	700.0
Inland	121.2	120.0	120.0	120.0	120.0	120.0
Mississippi	104.8	106.0	107.0	107.0	106.0	106.0
New Mexico	131.5	146.0	150.0	155.0	158.0	160.0
Southeastern	130.0	144.5	148.5	153.5	156.5	158.5
Northwestern	1.5	1.5	1.5	1.5	1.5	1.5
Texas	2,271.9	3,317.0	3,483.0	3,610.0	3,698.0	3,756.0
District 1	28.8	38.0	41.0	44.0	47.0	48.0
District 2	131.7	217.0	226.0	233.0	238.0	240.0
District 3	395.1	622.0	646.0	666.0	679.0	690.0
District 4	208.1	332.0	345.0	355.0	363.0	367.0
District 5	36.2	64.0	68.0	71.0	73.0	75.0
East Texas field	291.8	294.0	291.0	288.0	285.0	282.0
Other District 6	89.6	156.0	166.0	172.0	179.0	183.0
District 7-B	70.2	95.0	104.0	111.0	116.0	120.0
District 7-C	57.5	117.0	141.0	161.0	177.0	190.0
District 8	725.0	1,132.0	1,201.0	1,251.0	1,281.0	1,300.0
District 9	146.9	160.0	165.0	170.0	173.0	175.0
District 10	91.0	90.0	89.0	88.0	87.0	86.0
PAD District 3	3,168.3	4,329.0	4,563.0	4,739.0	4,857.0	4,945.0
Colorado	64.0	77.5	75.0	72.5	70.0	69.0
Montana	22.2	24.5	23.5	22.5	21.5	21.0
Utah	3.4	4.2	5.0	5.5	5.9	6.0
Wyoming	165.6	208.0	222.5	239.0	251.0	260.0
PAD District 4	255.2	314.2	326.0	339.5	348.4	356.0
California—PAD District 5	889.6	986.0	991.0	995.0	995.0	990.0
Total U. S. (exc. Naval Reserve)	5,394.3	6,783.6	7,060.6	7,278.3	7,416.4	7,523.2
Naval Reserve No. 1	8.0	95.0	100.0	97.0	94.0	90.0
Grand total	5,402.3	6,878.6	7,160.6	7,375.3	7,510.4	7,613.2

FORECAST OF NATURAL-GAS-LIQUIDS AVAILABILITY
(Thousands of barrels daily)

	Production 1950	Estimated availability 1951	1952	1953	1954	1955
PAD District 1	13.7	14.4	15.1	15.7	16.4	17.0
PAD District 2	64.1	74.2	82.0	88.0	93.1	96.6
PAD District 3	336.4	396.4	440.6	472.2	497.1	518.5
PAD District 4	5.9	6.2	6.5	6.7	7.0	7.3
PAD District 5	77.3	86.0	87.0	89.0	89.0	80.0
Total United States	497.4	577.2	631.2	671.6	702.6	728.4



Refining Forecast

Nation's processing capacity to reach 8,550,000 bbl. by end of 1955; increase of 1,619,000 bbl. over 1950

REFINERY capacity in United States will reach 8,550,000 bbl. daily by the end of 1955, according to estimates of Petroleum Administration for Defense.

This forecast is based on two assumptions:

1. The refinery-construction rate for the 1951-52 period will be slightly greater than normal.

2. The probable ratio of refinery operations to demand will remain nearly constant during a mobilization economy.

The Bureau of Mines report of capacity at the beginning of 1951 was used as a starting point. Some shutdown capacity was included in the total. Only when review indicated that a plant was incapable of operation short of major overhaul was it eliminated from effective capacity.

Additions to capacity in 1951-52 were based on reports to the Bureau of Mines of facilities under construction at the start of 1951 plus additional construction taken from certificates of necessity where the applicant estimated completion before the end of 1952. The net addition to capacity for the 2-year period on this basis was set at about 800,000 bbl. daily.

Correlating needed increases in refining capacity with forecast increases in demand, PAD estimated net additions to refinery capacity in 1953 at 269,000 bbl. daily. Daily average increases for 1954 and 1955 were forecast at 300,000 bbl. and 250,000 bbl. respectively.

Total net increase in capacity forecast for the 5-year period amounted to 1,619,000 bbl. daily. The breakdown by districts shows net additions of 308,000 bbl. daily in District 1, 590,000 bbl. daily in District 2, 548,000 bbl. daily in District 3, 27,000 bbl. daily in District 4, and 146,000 bbl. daily in District 5.

PAD Districts

Tank-Car Outlook

Total requirements fixed at 10,900 cars in 1952

THE petroleum industry will need 2,000 more general-purpose tank cars and 4,700 more pressure cars in 1952 than it had at the beginning of 1951, in the opinion of the PAD supply and transportation division.

General-purpose tank cars available during the 1950-51 winter were at least 2,000 below peak needs, and an additional 4,200 will have been scrapped by the end of 1952, according to the division's estimates.

New construction of 6,200 cars was recommended "to increase the inventory of general-purpose tank cars by 2,000 units" over and above replacement of scrappage.

New construction of 4,700 pressure-type cars would represent net additions to the pressure-car fleet, since the division expects a negligible number to be scrapped.

General-purpose cars.—A continued growth was anticipated by the division in rail movement of naphtha, aviation gasoline, and railroad diesel fuel.

A growth also was forecast in rail movement of principal light products but at a rate "not as great as the growth of the market."

The division's report said the supply of tank cars would naturally come into balance with demand in an unrestricted competitive economy, but it hastened to point out that "planning transportation facilities of petroleum for defense, however, is a deviation from a competitive economy."

The study shows there were 102,100 general-purpose cars available for petroleum service in the United States just before World War II, but that the figure had dropped to 81,023 at the end of 1950.

"It appears obvious that there is no slack in tank-car supply such as prevailed before World War II," the division added.

Pressure cars.—Cars suitable for movement of liquefied petroleum gases have doubled in number since the last war, reflecting the "phenomenal growth" of the L.P.G. industry.

As of January 1, 1951, a total of 10,302 were in L.P.G. service in this country, 9,853 of them privately owned and another 449 owned by the Reconstruction Finance Corp. and controlled by the Office of Rubber Reserve for transportation of butadiene and feed stocks.

The 4,700-car recommendation, the division emphasized, would not "provide an inventory adequate to meet the needs of an all-out war." Further, it does not include needs for interplant movement of aviation components.

Crude Lines Required

Industry ahead of Government; most lines recommended in PAD report already finished or being built by companies

ALL the major crude-oil pipe lines which the PAD transportation report said should be built by the end of 1952 already were completed or under way by the time the report was published.

The transportation study, started more than a year ago but just published in final form, said that 1,500,000 tons of line pipe must be fabricated and laid during 1951 and 1952 in order to give the oil industry the transportation facilities needed to keep up with growing demands and the increasing capacity to produce and refine petroleum.

But neither PAD nor the industry waited for release of the report. Various individual companies applied for and were given allocations of steel for the most obviously necessary projects, with the result that the bulk of the program will be pretty well completed by the end of this year.

The pipe-line projects outlined by PAD for 1951-52 construction totaled 1,499,100 tons of line pipe, not including pipe needed for maintenance. The total included 305,000 tons for products pipe lines, 180,000 tons for crude-oil gathering lines (at the rate of 90,000 tons per year), and 116,000 tons for miscellaneous extensions of crude lines during the 2-year period. The balance, 898,100 tons, was for important new crude lines.

What's been done.—Here is the score on the PAD recommendations and what has been done already:

Sheridan, Ind., to Lima, Ohio—completed by Ohio Oil Co.

Cushing-Drumright area of Oklahoma to Chicago through Kansas and Missouri—under construction by Sinclair Pipe Line Co.

West Texas to East Texas and Beaumont—under construction by West Texas Gulf Pipe Line Co.

West Texas to Houston—contracted for construction by Rancho Pipe Line System.

Louisiana Gulf to Texas Gulf Coast—under construction by Texas Pipe Line Co.

Borger, Tex., to Yale, Okla.—completed by Phillips Pipe Line Co.

Mississippi fields to Mobile, Ala.—completed by Gulf Refining Co.

Wyoming to Wood River, Ill.—under construction by Platte Pipe Line Co.

Alberta, Canada, to Puget Sound area—contracted by Trans Mountain Oil Pipe Line Co.

What remains.—Only three crude-oil projects listed by PAD have not yet been put into motion, and they are relatively minor in tonnage of steel required and apparently are not considered vital at this time by companies which might be expected to construct them. They are:

Increased capacity between West Texas and Drumright, Okla. This would be accomplished by looping an existing line, either that of Basin Pipe Line System or Service Pipe Line Co.

A new line from Clearbrook, Minn., to St. Paul, provided two proposed refineries are constructed in the Twin Cities area which would need to be supplied from the Interprovincial line running from Alberta to Superior, Wis. Construction of such refineries, and therefore need for such a crude line, appears to be indefinite at this time.

A new line from the Indiana-Ohio area to Central Michigan. This was proposed by PAD as a convenient way of keeping Michigan refineries operating at maximum capacity in event of emergency, but the report said that the crude might be supplied by lake tankers or other means.

Bases for estimates.—The PAD transportation division said that its analysis of needs for additional crude-oil lines was based upon the assumption "that sufficient crude should be made available in a given area to supply each refinery in that area at its full rated capacity."

It recognized, also, it said, the industry rule "that pipe lines into an area from a remote source should be of sufficient capacity to equal that part of refining capacity not served by local production or waterborne receipts."

In determining what crude would be needed, PAD forecast a net effective refining capacity in the United States by January 1, 1953, of 7,730,566 bbl. daily, compared with the net effective capacity for "all-out" operation on January 1, 1951, of 6,931,284 bbl. per day.

In making its study, the PAD division ignored individual refinery ownership and methods of supply and did not consider the manner in which specific crude lines were utilized.

"The total rated refining capacities of all refineries in an area is considered as a unit and the total capacity of all pipe lines into each refining area is treated as a unit. Also, in considering total outlet from a designated producing area, the capacity of all lines out of the area is considered," the report says.

Growth of inland refineries, the division said, is one of the big factors in the need for new crude-oil lines.

"Anticipated expansion of refining capacity (in District 2) alone," the report says, "amounts to 336,000 bbl. daily during 1951 and 1952. This will necessitate substantial additional pipe-line construction.

"In Districts 1 and 3 the planned refinery expansion amounts to 402,000 bbl. daily during this period which will necessitate pipe lines from inland producing areas to provide adequate crude oil at tidewater."

Declaring that no study could possibly reflect all long and short additions to trunk lines that will be required, the report says its analysis "points out the more significant long-line projects that appear essential."

Reports by areas.—Throughout its report PAD used no company names and did not identify projects. Its sole concern was in seeing that transportation facilities keep pace with expanding refining capacity and with the availability of crude oil in major producing areas.

For this reason the section of the study devoted to crude-oil pipe lines consisted of an area-by-area analysis of the 1952 refining capacity and crude availability together with additional pipe lines, if any, needed to maintain a balance in each area. The report contains an elaborate series of maps giving these data for each major producing and refining area of the country.

Pipe-Line Question

Chapman for, PAD against West Texas-California line

THE ultimate fate of long-standing proposals to build a crude-oil pipe line from West Texas to California remains in doubt as a result of the publication of the PAD transportation report.

The report definitely recommended against such a line, but quite recently Secretary of the Interior Oscar Chapman announced that serious consideration was being given to allocating steel for its early construction *(The Oil and Gas Journal, February 18, page 89)*.

Instead, the PAD report recommended construction of a crude line from Alberta to Puget Sound to provide Canadian crude to take care of the anticipated deficiency in supply on the Pacific Coast. During the interval between drafting and publishing the report, Trans Mountain Oil Pipe Line Co. has received approval for this line and has begun work on the project *(The Oil and Gas Journal, December 27, page 41)*.

According to logistics data in the report, this Canadian line will meet the Pacific Coast's needs for several years to come and thus would seem to make the West Texas line unnecessary.

Pacific Coast refineries will not have enough crude to meet demands

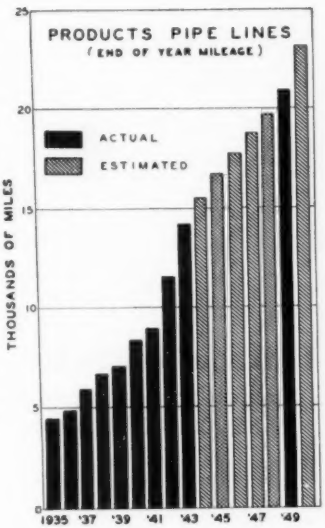
unless the 100,000 bbl. daily shut-in capacity of Elk Hills Naval Reserve is made available, the report asserted, so provision must be made for a new source of supply.

Canadian line favored. — One reason PAD favored the Canadian line is that it would serve the area of Oregon, Washington, and British Columbia, which has a market for 285,000 bbl. daily and which otherwise must be served by tanker from California, a movement which PAD said would be difficult to maintain in time of national emergency. The report contemplated that refining capacity in the Puget Sound region would be expanded to handle crude from the Canadian line.

Alberta, the report estimated, will have crude-producing capacity beyond other transportation outlets ranging from 140,000 bbl. per day in 1953 to 190,000 bbl. per day in 1955, and thus could support a Puget Sound line with an initial capacity of 70,000 bbl. per day and an ultimate capacity of 200,000 bbl. per day.

Texas line opposed. — A crude line from West Texas to southern California would be more than 2,200 miles in length compared with 800 miles for the Canadian line and thus would take more steel, the report said, and additional tankers would be required to move the refined products to the Northwest.

Moreover, PAD intimated that the logical outlet for West Texas crude in case of national emergency would be the Gulf Coast, and the report contemplated that crude lines soon to be constructed eastward would be able to handle the excess producing capacity of West Texas and New Mexico.



Product Lines Needed

PAD figures 1951-52 projects should total 4,400 miles; pipe lines carrying increasing percentage of total demand

PRODUCT pipe lines are carrying an increasing proportion of the nation's fuel supplies and will carry an even greater percentage of all products manufactured in the future, the supply and transportation division of PAD believes.

Deliveries by product pipe lines in 1952 will average 1,485,000 bbl. per day, the division predicts, an increase of 408,000 bbl. per day over 1950's average daily movement of 1,077,000 bbl.

This 2-year increase in product-line capacity means the laying of a total of 4,400 miles of lines requiring 305,000 tons of new steel. The steel estimate is based on PAD's assumption that 400 of the 4,400 miles of new product lines will be built with second-hand pipe previously used in crude-oil service.

"Product pipe lines are moving an increased proportion of the petroleum marketed each year," the division's report states. "Their place in the transportation of petroleum is well established, and product pipe-line movement will continue to grow at a greater relative rate than total consumption."

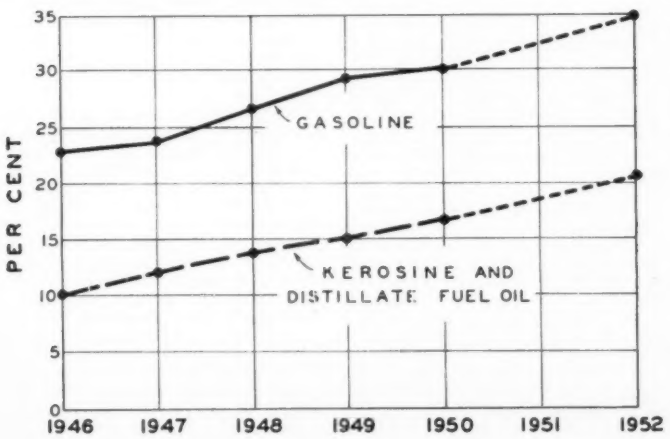
"Further," the report says, "the continued increase in product pipe-line deliveries is an essential element in the efficient transportation of petroleum."

From a study of lines operating in 1950, the division figured that 1.08 tons of steel would be required for each barrel added to daily capacity of the nation's product systems. However, an analysis of lines under construction or planned during 1951 indicates, it said, that, assuming the same average length of haul, the steel requirement will be reduced to about 0.8 ton per barrel "because of an increased proportion of larger-size lines."

Another factor in the division's estimate of steel needs is the fact that product lines being built and planned have an average haul of 329 miles compared with an average of 306 miles in lines in use at the end of 1950, the report said.

The division said its analysis covers "only commercial product lines within the United States" and said its estimated steel requirements were made on an "over-all basis to accomplish what is believed to be necessary expansion in total pipe-line deliveries."

Per Cent of Total Demand Moved by Pipe Line



Gathering-Line Needs

The petroleum industry will need 90,000 tons of new pipe a year to provide adequate gathering systems if the industry drills new wells at the rate of 43,400 per year.

This estimate was arrived at by the supply and transportation division of PAD, which predicted that a total of 138,000 tons will be needed but that 48,000 tons will be obtained by picking up pipe from existing gathering systems.

Other assumptions upon which the estimates are based are these:

Gathering lines will be needed at

the rate of 9.1 miles per 100 new wells drilled.

Of all wells drilled, 56 per cent will be oil producers.

The industry will take up 72,100 tons of gathering-line pipe each year, of which two-thirds will be found to be reusable.

These assumptions were reached by taking the experience over a period of years of 11 companies of good geographical distribution which at the end of 1949 owned 43 per cent of the nation's gathering-line mileage. The information was taken from the companies' reports to the Interstate Commerce Commission.

Tankage Needs Up

Product-storage increase of 85,200,000 bbl. urged

BY the end of 1952 crude-oil and product storage capacity should be 85,200,000 bbl. greater than it was at the beginning of 1951, in the opinion of the supply and transportation division of PAD.

In addition, 2,000,000 bbl. should be added to the nation's storage facilities for liquefied petroleum gas, the division estimated.

In connection with its exhaustive study of petroleum-transportation needs, the division made a comprehensive analysis of the nation's existing bulk-storage facilities.

It concluded that by the end of 1952 tankage at refineries should be increased by 36,500,000 bbl. compared with the end of 1950, and that tankage used in pipe lines, tank farms, and at terminals should be expanded by 48,700,000 bbl.

Steel required for construction of crude and product storage was estimated by the division at 426,000 tons and that for L.P.G. at 125,000 tons.

These estimates, the division pointed out, do not include tankage requirements in Canada.

"Data are not available for an analysis of that nation's needs," the report says. "However, this study recommends a crude line from Alberta to the Puget Sound area. This recommendation will require detailed layout to determine specific tankage needs. Customary standards of tankage requirements on such projects, plus a known need to secure best utilization of a present facility, indicate the project will require construction of 8,700,000 bbl. of crude-oil storage."

Further, the division said, the estimates "do not include oil producers' lease tanks, marketing storage beyond terminal level, consumer storage, or storage required by the military."

"In connection with military storage," it added, "it must be recognized that any additional industry tankage that may be leased for military use must be replaced and would represent, in that event, a requirement in addition to those set out above."

TANKAGE REQUIRED IN 1951 AND 1952*
(Thousands of barrels)

	At refineries	Pipe lines, tank farms and terminals	Total
Clean products	21,100	31,000	52,100
Residual fuel	4,300	1,200	5,500
Other products	1,500	1,800	3,300
Crude petroleum	9,600	14,700	24,300
Total	36,500	48,700	85,200
Tons of steel			
Clean products	105,600	154,900	260,500
Residual fuel	21,400	6,100	27,500
Other products	7,300	9,200	16,500
Crude petroleum	48,000	73,500	121,500
Total	182,300	243,700	426,000

*Does not include pressure storage.

Short-Trunk Estimates

PAD's supply and transportation division estimated the nation's need for short trunk lines and extensions for each of the years 1951 and 1952 at 701 miles requiring 58,010 tons of steel.

This is a net figure representing the requirement for new pipe and is based on PAD's estimate of recovery and relaying of serviceable second-hand pipe.

To arrive at the estimate, PAD relied on the experience of 10 companies operating between 60 and 70 per cent of the nation's crude-oil trunk lines. It also assumed a completion rate of 23,400 oil wells per year.

The 10 sample companies during a 4-year period laid 1,408 miles of lines while 78,057 producing wells were drilled, or 1.8 miles per 100 wells. "With a national drilling program of 24,300 producing oil wells per year . . . these sample companies will lay 440 miles of short trunk lines each year," the report said.

Considering the percentage of total lines laid by these sample companies and allowing for the fact that their lines are larger than the national average, the division figured total industry requirements at 701 miles.

More Barges Recommended

Estimated demand for barge transportation of petroleum on July 1, 1952, indicates the need for construction of barges totaling 2,566,000 bbl. in capacity during the year ending then.

This new construction, estimated by the PAD supply and transportation division to be needed, would provide a net addition of 2,106,100 bbl. to the nation's barge capacity, assuming that 460,000 bbl. of the new construction would replace worn-out equipment.

For its analysis, the PAD division defined barges as all U.S. flag tank ships operating on the Great Lakes, all other tank ships under 31,300 bbl. capacity, and all self-propelled and nonpropelled barges.

To determine the need for new construction, the division projected, first, the relationship in 1950 between total product demand and the percentage carried by water transportation, and second, the upward trend in the use of water-borne transportation.

The survey shows that a total barge capacity in 1952 should be 3,002,000 bbl. greater than it was in 1950. Increases in capacity requirements by areas are: Atlantic Coast 636,000 bbl.; West Coast, 116,000 bbl.; and Districts 2 and 3, 2,250,000 bbl.

WEST COAST

Well Has Remarkable Record

BAKERSFIELD. — A remarkable record of consistency and performance has been compiled by a 41-year old well in East Coalinga field of Fresno County, California.

The well, Shell Oil Co. 57-27, was completed in February 1911 as a 250-bbl. producer in a 2,000-ft. sand. Throughout its life No. 27 has continued to produce at the rate of 200 to 300 bbl. daily. After turning out over 2,753,000 bbl. of crude, to become the largest cumulative producer in the area, it still is pumping in the neighborhood of 200 bbl. daily.

No. 27 also has established an outstanding maintenance record. From 1943 to date there has been only one pump change made; since 1931, as far back as its pulling records go, there have been only 10 pump changes made.

Offshore Survey Started

LOS ANGELES.—A new group of oil companies has started a seismic survey of offshore areas lying between Santa Barbara and Point Conception, Calif., 40 miles westward.

The work, a large-scale operation using six vessels and 30 men, is being done for Standard Oil Co. of California, General Petroleum Corp., and Humble Oil & Refining Co. Western Geophysical Co. is performing the survey.

Black-powder charges are being substituted for dynamite because of the greatly reduced damage done to marine life (*The Oil and Gas Journal, August 2, 1951, page 40*). Self-orienting seismometers also are being used for the first time on the Pacific Coast.

Union Oil Co., which with Scripps Institute of Oceanography last year developed the slow-burning powder technique, in February completed a 3-month survey conducted between Carpenteria and Capistrano Beach. Union represented Shell Oil Co. and Continental Oil Co. in this work, all of which was done under the supervision of the California Fish and Game Commission.

Strike Threat Lessens

Industry thinks shutdown would so affect defense effort that Government will not let major strike materialize

Ted Armstrong

THERE was a growing feeling among oil men at week's end that there will be no nation-wide strike in the petroleum industry.

If it should develop, they feel, it will be of short duration and will have little effect on the ability of the industry to continue to meet the nation's demand for products.

The reasoning is based on the assumption that a major shutdown of refineries, production facilities, or gas-transmission lines would so affect the defense program and the economic and social life of the country that the Government would not allow the strike to take place.

In addition to comments of industry leaders, themselves, this attitude was reflected in the market picture. The rush to get products from refineries into secondary storage which developed when the strike threat first became serious had lost its urgency last week. Suppliers' reports that movements were falling off during the first week in March indicated a change in the industry's attitude toward the strike threat.

In Washington administration officials were determined to avert the strike if at all possible.

Many observers were reluctant to see the issue turned over to the Wage Stabilization Board but considered the move necessary without an amicable settlement between the unions and the companies.

Market picture. — Shifts in activity here pointed to a change in the viewpoints of suppliers.

Late in February refiners reported a sharp increase in orders and shipping instructions as marketers rushed to move products to secondary storage. A large part of the movement was in District 2, where markets have been soft since early in the year and where, due to dropping prices, marketers had not been keeping storage up to normal.

Under the influence of the threatened strike before the postponement was announced, refinery runs for the week ended March 1 set an all-time record of 6,816,000 bbl. daily.

Last week suppliers were easing off on their movements, suggesting considerably less fear that refinery supplies would be tied up for any length of time.

If a strike should develop it would put additional pressure on natural gasoline at a time when the market for this product is seasonally soft. Group 3 price for Grade 26-70 natural dropped from 6.875 cents to 5.5 cents per gallon with three cuts within a period of 9 days, the last on March 5.

West Coast outlook.—In the Far West negotiations lagged behind those in the rest of the country, and it appeared the drive for higher wages there would be separate from other union-industry negotiations.

Union representatives last week met with representatives of The Texas Co., Richfield Oil Corp., General Petroleum Corp., Tide Water Associated Oil Co., Shell Oil Co., and Standard Oil Co. of California.

Both state and federal mediators were participating in the discussions. Strike votes were asked by leaders of some locals to strengthen their bargaining position.

Company feeling was that the WSB would take over in event of a critical threat.

Gulf Coast picture.—In this critical refining area fingers were crossed as the second strike deadline approached.

In all, 13 refineries on the Texas Gulf Coast have been notified to make preparations for an orderly shutdown. Combined operating capacity of these refineries is 1,213,000 bbl. daily.

Another 13 refineries, with a combined current operating capacity of 984,000 bbl. daily, would not be affected by a strike. Seven of these are in Texas and six in Louisiana. None of the 13 strike-threatened plants is in Louisiana.

Strike background. — The threatened nation-wide strike had its genesis 6 months ago in a meeting of the policy committee of the C.I.O. Oil Workers International Union in Denver.

At this meeting, last September 15, the committee adopted a negotiating policy calling for a 25-cent hourly wage increase and 6 and 12-cent shift differentials.

The subsequent steps, which culminated February 20 when the coordinating committee representing the C.I.O. Union, A. F. of L. and all independent unions met in Denver and set a strike deadline of March 3, were as follows:

September: The Central States Petroleum Union, an independent federation of about 20 locals representing principally Standard Oil Co. (Ind.) employes from Detroit through Wyoming, adopted a policy of seeking increases of 30 cents an hour or the equivalent.

November: Eighteen unions, C.I.O. and other, with a membership total of 250,000 met in St. Louis and pledged mutual support for increases of at least 25 cents an hour and the increased shift premiums demanded by the O.W.I.U., marking the first time in which the different organizations in the oil industry got together on a mutual program.

February 2-3: A second interunion conference was held in Kansas City with 22 unions and 275 members represented, to develop further strategy.

February 3: The O.W.I.U. policy committee met in Kansas City and adopted a resolution calling for a national strike.

February 4: O.W.I.U. President O. A. Knight sent letters to 300 selected bargaining groups in his union, asking them to take strike votes.

During Washington conferences with Federal Mediation Director Cyrus Ching, the O.W.I.U. disclosed that if the strike takes place it will not immediately close down the industry as a whole but would start with "a substantial portion of the industry" where contracts have expired, spreading as additional contracts terminate.

Bargaining in the oil industry is virtually all carried on at the local level on a plant-by-plant basis. The O.W.I.U., for example, has nearly 60 separate contracts with The Texas Co. alone. The only national contract is that with Sinclair Oil Corp., covering 10,000 field production, pipe line and refinery employes.

Industry Briefs

CLEWISTON, Fla.—Coastal Petroleum Corp. has obtained leases on 100,000 acres of land in Florida south of Lake Okeechobee from U. S. Sugar Corp., of Clewiston. Coastal Petroleum is a subsidiary of Pancoastal Oil Corp. whose president, Louis W. Storms, said a deep test will be started on the acreage this year. Contract calls for drilling to get under way within 2 years.

DENVER.—Colorado's deepest test well has been plugged back and completed up the hole as a gas discovery. The well, Mountain Fuel Supply Co. 1 Unit, Lot 5, 14-12n-100w, Hiawatha field, was drilled to a total depth of 14,702 ft. to a formation thought to be the Nugget. It was completed flowing 9,000,000 cu. ft. of gas daily from 4,885-4,930 ft. in a new Upper Cretaceous producing zone. The sand is believed to be a blanket through this area, rather than the lenticular sands productive in the Tertiary.

New Field for Oil

Ammonia producers switching from coke to petroleum gases as source material; fourth oil company entering field

George Weber

LIKE a number of other chemical operations, the synthesis of anhydrous ammonia is rapidly swinging to the petroleum industry for its primary source of raw material. Economics and uninterrupted availability are the principal reasons.

As a result of the trend, oil companies are increasing their participation in this phase of chemical synthetics.

Since it is an inorganic compound, ammonia is not universally considered a petrochemical when synthesized from atmospheric nitrogen combined with hydrogen derived from natural gas. However, as one of the five major tonnage chemicals produced in this country, ammonia represents a growing demand for natural gas in large volumes. Furthermore, it shows promise of becoming integrated into future refinery operations.

By the end of this year, total daily natural-gas requirements for ammonia synthesis will approximate 250,000,000 cu. ft., of which about 85,000,000 cu. ft. will enter directly into ammonia synthesis. Indicated expansion of ammonia capacity in response to a government defense program may increase natural-gas requirements to as much as 350,000,000 cu. ft. per day within the next 3 years.

Old plants converted. — The swing from coke to natural gas as a source of hydrogen is evident both in new plants and in existing capacity, much of which has been and is being converted over to natural gas.

The trend began during World War II. Prior to that time, less than 7 per cent of synthetic-ammonia capacity in this country was based on the use of natural gas. New plant construction during the war and since, has shown a marked preference for natural gas, with the result that the percentage of product so derived rose to 43 per cent by 1950.

Conversion of major existing plants is slated for completion this fall with the result that nearly 75 per cent of all ammonia will be based on petroleum industry sources by the end of 1952.

New plants to use gas.—Now a second record round of plant construction is under way to relieve the severe shortage of ammonia and ammoniated products. A government program calling for the addition of 431,000 tons per year of ammonia, supported by the granting of certificates of rapid amortization, shows signs of being over-subscribed by private industry.

The Defense Production Administration reports receipts of 23 applications for such certificates, involving over one million tons of ammonia capacity. From these, certificates have been awarded for 16 plants to cost an estimated $200,000,000. These proposed plants, some of which may not be built, would produce the equivalent of 1,848 tons per day or 675,000 tons per year of equivalent nitrogen in numerous gaseous, liquid, and solid forms.

The predominance of proposed plants which are based on natural and refinery gases indicates that if these new facilities are built, roughly 80 per cent of all synthetic ammonia and ammoniated products will derive from such sources in the near future.

Oil firms involved.—As a result, the proportionate share of oil companies in this expanding operation is also growing. Of the existing plants based on natural gas, three oil companies with as many plants, account for about 30 per cent of total capacity.

Each company now in the business of synthesizing ammonia is planning a second plant and a fourth oil company is entering the field. If companies which to date have received amortization certificates follow through with plant construction, the oil industry's share in the expanded capacity based on petroleum sources will rise to about 37 per cent.

Four oil companies have received amortization certificates for four new plants to cost an estimated $80,000,000. In addition to the established operators—Lion Oil Co., Phillips Petroleum Co., and Shell Chemical Co.—Atlantic Refining Co. is entering the industry.

Atlantic's operation is unique, based not on natural gas, but on excess hydrogen to be produced in a large catalytic reforming unit now building at the Philadelphia refinery. The unit which has been contracted, will produce 100 tons a day of ammonia, representing about 82 tons per day of equivalent nitrogen.

SYNTHETIC ANHYDROUS AMMONIA FACILITIES
(Plant capacities in tons per day of equivalent nitrogen)

Company	Plant location	Source of hydrogen: Natural gas	Coke	Chlorine byproducts
Operating plants				
Commercial Solvents Corp.	Sterlington, La.	136		
Dow Chemical Co.[1]	Freeport, Tex.			100
Dow Chemical Co.	Midland, Mich.			54
Dow Chemical Co.	Pittsburg, Calif.			15
E. I. du Pont de Nemours Co.	Belle, W. Va.		490	
E. I. du Pont de Nemours Co.	Niagara Falls, N. Y.			21
Hercules Powder Co.	Pinole, Calif.	60		
Hooker Electrochemical Co.[2]	Tacoma, Wash.			30
Lion Oil Company	El Dorado, Ark.	470		
Mathieson Chemical Co.	Lake Charles, La.	242		
Mathieson Chemical Co.	Niagara Falls, N. Y.			15
Mathieson Chemical Co.[3]	Morgantown, W. Va.		453	
Mississippi Chemical Corp.[4]	Yazoo City, Miss.	97		
Pennsylvania Salt Co.	Wyandotte, Mich.			24
Phillips Chemical Co.	Etter, Tex.	361		
San Jacinto Chemical Co.	Houston, Tex.	48		
Shell Chemical Co.	Pittsburg, Calif.	217		
Solvay Process Co.[5]	Hopewell, Va.	655		
Solvay Process Co.[6]	South Point, Ohio	435		
Spencer Chemical Co.	Pittsburg, Kans.	380		
Spencer Chemical Co.[8]	Henderson, Ky.	163		
Tennessee Valley Authority[4]	Wilson Dam, Ala.	151		
Total operating plants		3,415	943	268
Plants proposed or building				
American Cyanamid Co.[7]	New Orleans, La.	136		
Atlantic Refining Co.[8]	Philadelphia	82		
Consumers Cooperative Association	Lawrence, Kans.	114		
Commercial Solvents Corp.[7]	Sterlington, La.	145		
Diamond Alkali Co.[7]	Houston, Tex.			33
Food Machinery & Chemical Co.[7]	S. Charleston, W. Va.			38
Lion Oil Co.[7]	New Orleans, La.	242		
Mathieson Chemical Co.[7]	Lake Charles, La.			38
Pennsylvania Salt Co.[7]	Wyandotte, Mich.			54
Phillips Chemical Co.[7]	Houston, Tex.	348		
Shell Chemical Co.[7 9]	Dominguez, Calif.	121		
Solvay Process Co.[9]	Hopewell, Va.	109		
Solvay Process Co.[7]	South Point, Ohio	163		
Spencer Chemical Co.[7 9]	Vicksburg, Miss.	157		
Woodward Iron Co.[7]	Woodward, Ala.		54	
Total planned capacity		1,617	54	163
Expanded capacity		5,032	997	431
Grand total projected		6,480		

1. Recently expanded with a certificate for rapid amortization. 2. New plant recently completed with a certificate of rapid amortization. 3. War-built government plant to be reopened this spring under Mathieson operation. Conversion to natural gas reported under consideration. 4. New plant completed June 1951 with certificate of rapid amortization. 5. Conversion from coke to natural gas will be completed in third quarter 1952. 6. Conversion from coke to natural gas completed. 7. Granted certificate of rapid amortization. 8. Granted certiifcate of rapid amortization. Will utilize hydrogen produced by catalytic reforming of naphthas. 9. Construction begun.

In view of the bright future for catalytic reforming in the refining industry, the Atlantic operation may well be the forerunner of a new phase of ammonia production based on the hydrogen released by dehydrogenation of naphthenes present in raw naphtha charge stocks.

More nitrogen wanted.—In a recent address before the American Coke and Coal Chemicals Institute in New York, Chester S. Edwards, president of Nitrogen Products, Inc., called attention to the fact that the government, in addition to approving plans for current expansion of ammonia production, is asking for an additional 500,000 tons of nitrogen capacity by 1955.

The response to date in the form of applications for rapid amortization certificates indicates that this nearly two-fold increase in synthetic ammonia capacity may well be realized by that year.

Capacities reported in the accompanying table are based largely on figures compiled by Nitrogen Products, Inc. In addition to basic anhydrous ammonia, these plants are designed to produce a number of nitrogenous end products including ammoniating solutions, ammonium nitrate, calcium ammonium nitrate, nitrate of soda, urea, uramon, and ammonium sulfate. Therefore the common denominator of equivalent nitrogen is used to show estimated plant capacities.

Producers Meet

Southwest A.P.I. members discuss Spraberry trend area, automatic controls, varied topics at Shreveport meeting

Walter Rose

SHREVEPORT.—The vast Spraberry trend area of West Texas, automatic controls for wells and tank batteries in East Texas, problems of using lime-treating mud on the Gulf Coast, and contract clauses covering crooked-hole drilling highlighted discussions of the American Petroleum Institute's southwest district Division of Production meeting here last week.

The meeting was the first of five to be held by the A.P.I. in various areas of the country this spring. More than 750 attended the Shreveport gathering at the Washington-Youree Hotel.

Spraberry.—Three papers dealing with problems in the Spraberry trend were presented to the group, including discussions on geology, drilling and completion practices, and the production - performance characteristics of the trend area.

Automatic controls.—Harry Pistole and Bruce Sullivan, of Humble Oil & Refining Co., discussed the company's success in use of automatic controls to wells and tank batteries in the East Texas area.

While not claiming novelty of concept, the authors gave examples of just what can be achieved through the use of these controls under optimum conditions.

The electrically powered controls are used for tank switching, gaging, and sampling, control of lease valves, and pumping wells.

Lime-treated mud.—The advantages and problems encountered when lime-treated mud is employed in deep Gulf Coast drilling operations were outlined by George Gray of Baroid Sales Division. His paper, prepared with the aid of several coauthors, pointed out that at present relatively few wells are drilled below 10,000 ft. with any other type of drilling fluid.

Ease of control, economy of maintenance, and resistance of contamination were cited as among the lime-treated muds' advantages. One serious problem encountered, however, is their tendency to solidify during round trips.

Gray said that hardening is not due to water loss, but is of chemical origin, and the remedy lies in use of chemical agents, such as tannins, lignites, and other organic mud thinners.

Crooked-hole drilling.—R. B. McCloy, Stanolind Oil & Gas Co., Oklahoma City, said that current use of deviation clauses in drilling contracts is unrealistic when only drift-angle limits are specified. Drift angle alone, he said, takes no cognizance of rate of change of drift, or direction of drift.

Horizontal as well as vertical displacement must be considered, he said, pointing to the need to develop methods which will measure these parameters during the drilling operation.

McCloy cited several instances where, surprisingly enough, crooked-hole drilling was more economical than straight holes drilled under similar conditions.

Reservoir classification.—J. C. Allen, The Texas Co., classified reservoirs intermediate between the simple gas and the simple black-oil reservoir. He showed that earlier classification schemes based on producing gas-oil-ratio characteristics were inadequate for the intermediate gas-condensate-type cases.

CANADA

Boon to British Columbia

VICTORIA, B. C.—Expansion and modernization of refinery capacity and the introduction of such new industries as petrochemicals are predicted for British Columbia on completion of the new Trans Mountain pipe line.

In a recent address before the Chamber of Commerce and Rotary Club here, John Fairlie, manager of the coordination and economics department of Imperial Oil, Ltd., told British Columbians that the line will be started this month and completion is expected by 1954.

With initial capacity planned at 37,500 bbl. per day, the line will deliver only enough oil to meet immediate demands in British Columbia. It will lay crude down in Vancouver at the same price as imported crude from California. If and when capacity is expanded to 150,000 bbl. per day, initial pipe-line charges of 60 cents per barrel would be cut roughly in half, he said. If that should happen, Alberta oil would become cheaper than domestic crude in such markets as Seattle.

The $80,000,000, 695-mile pipe line from Edmonton to Vancouver will give western Canada its first oil outlet to the Pacific Coast.

Alberta Returns Said Large

EDMONTON, Alta.—The Alberta government has received about 35 per cent of the gross value of oil produced at Leduc and Redwater since the discovery of these two richest of provincial oil fields.

This was disclosed in the current session of the Alberta Legislature by N. E. Tanner, minister of mines and minerals in the Social Credit government. The Social Credit government is an exponent of free enterprise.

Tanner's disclosure was in reply to a question by Elmer Roper, provincial C.C.F. leader. The C.C.F. is a socialist party and has constantly reiterated that the people should get more and the oil companies less of Alberta's oil wealth.

Tanner said that well-head value of all oil produced at Leduc and Redwater to December 31, 1951, was $218,383,240. In the same period government revenues from oil in the two fields totaled $76,030,352.

The minister said that at the beginning of this year Leduc producers numbered 800 wells and Redwater 898. Well-head value of Leduc oil in the 5 years since discovery to last December 31 was $116,376,378, while government revenues from Leduc in the period were $11,269,230.

Redwater well-head value of oil production was $102,005,862 since its discovery in 1948.

Tidelands Work Resumed

Interior Department has granted 11 drilling permits off Louisiana coast, but only "in interest of conservation"

Walter Rose

NEW ORLEANS. — Oil operators with holdings in the disputed tidelands area off Louisiana no longer are holding up development work on the assumption that an early settlement of the ownership dispute will be forthcoming.

Anxious to see some return on their multimillion-dollar investments, the companies are now carrying out the development program with official sanction of the U. S. Department of the Interior, which is granting drilling permits solely "in the interest of conservation."

Heretofore, since December 11, 1950 —the date when federal authorities assumed ownership of the tidelands on the basis of the Supreme Court's ruling—offshore operations had been largely confined to completing wells then drilling, reworking completed wells, producing completed wells, and placing on production wells which were shut in awaiting transport facilities.

Magnolia Petroleum Co. was the first company to obtain a permit from the Interior Department. Since this firm "broke the ice" in obtaining permission to carry on development "in the interest of conservation," four other companies have followed suit in obtaining the permits: Pure Oil Co., Shell Oil Co., Phillips Petroleum Co., and Sun Oil Co.

Magnolia work.—At the time of the 1950 Supreme Court ruling Magnolia was drilling a well in Block 8 in the West Cameron offshore area because it was suspected that onshore production by a competitor in Holly Beach field was depleting gas reserves under Magnolia leases.

While shows of gas were encountered, this offshore well was never completed as a producer. Subsequent to the court's ruling, however, Magnolia obtained a permit both from the Interior Department and the Louisiana Department of Conservation to drill an additional offset exploratory well in Block 7 of the West Cameron area. While this latter well also proved unsuccessful, it set a precedent for operators having only state leases to obtain drilling permits from the Government.

Since the first venture Magnolia has drilled two additional wells in the tidelands area under federal permit issued by the Interior Department and has recently obtained a permit to drill a third well.

Interior's position.—Mastin G. White, solicitor of the Interior Department, said that permits for Gulf of Mexico wells were granted "on the grounds of conservation and each time that the U. S. Geological Survey so recommends."

White said that granting of the permits was "routine" and that this was the "general" policy of the Interior Department. Drilling will be allowed whenever conservation can be served, he said.

The department's interpretation on issuance of the permits is contained in the following paragraph, from a letter of permission by Oscar Chapman, Secretary of the Interior, to Pure Oil Co.:

"The proposed well is believed to be necessary in order to provide the essential geologic and engineering data necessary to formulate the producing and development practices which will tend to secure the economic maximum recovery from the field in accordance with sound conservation policies, with respect to operations authorized by the notice of the Secretary of the Interior dated December 11, 1950, as amended and supplemented."

The notice referred to was issued after the Supreme Court entered its decree in the Louisiana and Texas cases, which in effect forbade all new operations without express permission of the Secretary of the Interior, who continued to reiterate that he did not have the authority to allow general drilling.

Current activity.—Only 11 wells, 1 of them an offset against an inland-bay operation, have been authorized to be drilled off the coast of Louisiana since the Supreme Court decree, Interior Department records show.

Eight of the wells have been authorized in the past 4 months, and there are currently three or four preliminary applications for other wells pending in the department.

With the exception of the one offset, all of the wells have been authorized for conservation purposes only, in line with the department's policy.

At the present time there are 77 oil and 7 gas wells producing in the Louisiana submerged lands, some of them definitely in open-sea areas, others in close-in areas which could finally be classed as either offshore or inland, and still others in bays and other areas uncontestedly classified as inland waters to which the federal Government lays no claim.

In addition to the producing wells there are 11 oil and 27 gas wells shut in.

No offsets.—None of the permits now outstanding is for an offset. All are classified as "conservation" wells apparently designed primarily for better evaluation of reserves. Holders of state leases—no federal leases have been granted—are required to pay to the federal Government the rentals, royalties, and other payments provided for in their leases, the money to be held in escrow.

The notice of the conditions under which operations could be continued, issued by the department December 11, 1950, stipulated that "the secretary of the interior will not grant, in return for such payment, any right to inaugurate operations for the discovery and production of oil and gas within the area of submerged coastal land covered by the state lease, or any other right respecting such land."

The eight permits now outstanding allow the drilling of a well by Pure in Block 32, Eugene Island area; one by Sun in Block 33, Eugene Island area; four by Shell in Block 24 field, South Pass area; one by Magnolia in Block 119, Eugene Island area; and one by Phillips in Block 27, Ship Shoal area.

Magnolia's Eugene Island area well in Block 45 field, actually located in the northwest corner of adjacent Block 51, was completed last week as an oil producer. The company's directional well is being drilled from an existing platform into the Eugene Island area, Block 126 field.

Pure's Eugene Island area well in Block 32 gas-distillate field is now drilling below 1,000 ft.

Operators' interpretation. — Officials of oil companies presently engaged in tidelands drilling programs assert, with more-or-less uniform agreement, the following:

1. The Supreme Court ruling assigning ownership of the tidelands to the federal Government makes it appropriate for operators to petition the Department of Interior for drilling permits. Actually, this is done on the assumption that should Congress not reverse the court ruling by new legislation, the federal Government would honor the priority of lessees now operating under state leases previously issued in good faith.

2. Granting of drilling permits by the Department of Interior can be reasonably expected when the necessity for drilling is based on the desire to prevent wastage, drainage, underground reservoir damage, or premature reservoir abandonment. From a liberal interpretation of this situation any operator now having state leases off any Gulf Coast state

could obtain permits to drill any type of well, other than a rank wildcat well.

3. The safe thing is to obtain drilling permits from Louisiana state authorities as well as federal authorities. This practice has been widely followed, for there are many who believe that eventually the Congress will assign ownership of the tidelands to the states.

It is well known that the meager production since December 11, 1950, has not begun to reimburse the deficit which had incurred up to that time. The current efforts by operators to reinitiate tidelands drilling is not intended to force the issue on the disputed tidelands ownership. Rather, they are seeking some return on their sizable investment made in good faith prior to the dispute.

Tidelands to Senate

More wrangling seen on O'Mahoney compromise bill

WASHINGTON.—The Senate finally got around to taking up the tidelands issue last week, but when the legislation is passed and what form it will take is anybody's guess.

The measure immediately before the Senate is the compromise O'Mahoney resolution giving the Secretary of the Interior 5 years' authority to issue oil and gas leases on the submerged lands subject to the approval of state authorities with respect to leases within the 3-mile limit *(The Oil and Gas Journal, February 11, 1952, page 77)*.

A strong effort will be made, however, to substitute the House-approved "quitclaim" bill, which would restore title to the tidelands to the states and return the situation that existed before the Government launched its effort to seize the submerged-oil resources off the coasts of California, Texas, and Louisiana.

Amendment possible. — In the event the quitclaim bill is defeated, attempts will be made to amend the O'Mahoney resolution in a number of ways, including the earmarking of government revenues from the oil and gas fields for federal aid to education.

Finally, if the Senate passes the O'Mahoney resolution, the issue will have to go to a conference committee which will have the last word as to what form the legislation shall take. Any measure approved by Congress will have to go to the President for signature, with the prospect of another veto if it is in the form of a quitclaim.

Big Drilling Program Set

MOBILE, Ala.—A heavy drilling program is anticipated this spring and summer for South Alabama according to State Geologist Walter B. Jones, who estimated that the new pool opened by Humble Oil & Refining Co.'s discovery well 2 months ago was 5 to 6 miles long and would support at least 35 wells.

Humble's second well, 1 mile southeast of the discovery, was dry and a third test has been started closer to the initial well. However, the irregular fault lines in the area are held at blame for the duster and oil men were not unduly concerned at the moment.

Jones said that in addition to Humble, he expected Gulf Refining Co. and Stanolind Oil & Gas Co. to carry on a heavy drilling program and said such a program was the real value behind the discovery well.

Leasing activity has been heavy in Alabama and in Northwest Florida and has extended to the southwestern tip of Georgia, a state which to date has not produced any oil.

Southern Natural to Expand

BIRMINGHAM. — A construction program calling for laying 1,255 miles of high-pressure gas line and an outlay of $76,000,000 has been announced by Southern Natural Gas Co.

The program, to be completed over a 3-year period, is aimed at supplying gas to cities in Alabama, Florida, Mississippi, and Georgia, and would increase capacity of Southern Natural's system by 350,000,000 cu. ft. per day, providing an over-all system capacity in excess of a billion cubic feet daily.

Thirteen gas fields in South Louisiana would feed the new facilities and lines up to 24-in. diameter will be laid in the gathering, transmission, and distribution of the gas.

The Federal Power Commission and Petroleum Administration for Defense have been asked to approve the project, according to C. Van Den Berg, vice chairman of the board.

NATIONAL AFFAIRS

Operators Warned

Steel applications should get in earlier, PAD says

WASHINGTON.—Unless applicants for priorities for steel for oil pipe lines and storage tanks file their requests further in advance of the start of construction they stand a chance of not getting the material, operators are being warned by the Petroleum Administration for Defense.

Hitting out at operators who "seem unaware that steel continues in tight supply," Deputy Administrator Bruce K. Brown declared applications should be in the hands of PAD now for all pipe-line and storage projects on which it is planned to begin construction during this year and the first half of 1953.

"Filing this far in advance is essential if PAD is to plan realistically for the industry's steel requirements and is to be able to substantiate its claims before the Defense Production Administration for allocations of scarce materials," Brown said.

"And unless PAD can substantiate its claims the industry certainly is going to be given less steel than it really needs."

Brown pointed out that under present conditions, an operator could not file for material this quarter and get delivery in the third quarter; he would be extremely lucky if he could get it in the fourth quarter.

Storage-tank lag.—The lag in applications is particularly marked in the case of steel for storage tanks. PAD now estimates that the total requirement for additional storage to meet demands by the end of this year will not be the 85,200,000 bbl. calculated in its transportation study in mid-1951 but 151,000,000 bbl. However, applications received so far are not nearly enough to meet even the minimum expansion needs.

The situation in line pipe under 16 in. in diameter is almost as bad. Many applications for allocations are not submitted to PAD until 60 or 30 days before the operator proposes to lay it, and under such circumstances it is practically impossible to get the steel in time to meet the construction schedule.

Defense Orders Revamped

WASHINGTON.—The following orders have been issued by the National Production Authority:

Amendment to M-6A, February 27: Defining "warehouse operations."

Amendment to M-69 and M-94, February 28: Setting up reporting requirements for consumers and suppliers of sulfur and sulfuric acid.

Amendment to M-38, March 3: Removing all restrictions on the use of lead.

M-99, February 29: Limiting the purchase of natural and synthetic cryolite pending establishment of full allocation.

Amendment to M-91, March 3: Authorizing suppliers to make deliveries of selenium on purchasers' certification of right to buy.

Amendment to M-81, March 4: Permitting small-order purchases of reagent chemicals containing tungsten.

Amendment to M-24, March 4: Establishing new classifications of irregular and off-grade tin plate and terne plate.

Sulfur Forms Due

Monthly report of refiners required; steel still tight

WASHINGTON.—Refiners and other consumers using more than 20 short tons of sulfur or sulfuric acid monthly will be required to submit monthly reports showing their receipts, end-use, and inventories, to be filed with the National Production Authority by the fifteenth of each month.

Reports for December 1951 and January 1952 are to be filed as soon as possible, and the first of the monthly reports, covering February, is to be filed by March 15.

Allotments of structural steel for the second quarter will permit the completion of all industrial expansion and commercial-building projects already started, it was announced by NPA. Included in these allotments was 51,480 tons for distribution through the Petroleum Administration for Defense.

The structural-steel situation is still tight for the present and immediate future, NPA Administrator Henry H. Fowler said, but there are definite indications it will ease later in the year.

Fabricators of metal piping, of which oil refiners are large users, told NPA officials, however, that delay in getting steel allotments is becoming a major problem.

Orders rejected.—The industry is operating at only 50 to 75 per cent capacity at present and, moreover, is rejecting numerous orders for pipe fabrication because of the uncertainty of procuring materials from steel mills. Many fabricators are running 6 months behind schedule on the orders they have.

The situation could be alleviated if steel allotments were made sufficiently in advance of the quarter in which they are to be used, it was declared. NPA officials admitted that delay was injurious and said they hoped to improve conditions.

NPA experts warned the industry to expect continued serious shortages of steel pipe, pointing out that demand for nickel-bearing stainless steel is currently running 212 per cent of supply. Where there has been a softening in demand it has been in the higher-priced steels which piping fabricators do not normally use.

Steel Bars On Critical List

WASHINGTON. — Cold-drawn and hot-rolled carbon-steel bars have been added to the list of "most critical" materials since the first of the year, but extension of the military-production time schedule and an improvement in imports have helped to ease supplies of some critical metals.

Changes in the metal situation since

WATCHING WASHINGTON

Bertram F. Linz

New Attack on Business

The Department of Justice has launched a new attack on business—but it isn't going to be tough about it.

The newest drive is to enforce Section 8 of the Clayton Act, which makes it unlawful for the same person to hold directorships in two or more competing corporations at the same time if any one of the corporations has capital, surplus, and undivided profits of more than $1,000,000.

As it announced the filing of its first cases to this end, the Federal Trade Commission got into the act with a recommendation to Congress that it amend the act to make it unlawful for an officer of a company to be a director of a competing concern.

Where interlocking directorships exist it is not necessary for the companies to be in competition all along the line. One company may be a retailer and the other a manufacturer with its own retail outlets, as in the case of the complaint against Sears, Roebuck & Co. and B. F. Goodrich Co., which compete in the retail sale of tires and tubes, automobile accessories, and other products which Goodrich manufactures.

Four such cases were filed as the first move in what the department announced as a program aimed at securing strict enforcement of this requirement of law.

A Delicate Situation

The Federal Trade Commission has been holding up its report on the relationships between American and foreign oil companies because of the possible effect on the delicate situation in the Middle East of what it apparently considers sensational disclosures.

In reaching a decision to defer publication of the report commission officials were concerned not only with the situation in Iran but also with the tense situation which exists in Iraq and other highly important Middle East areas.

Touching upon the report in discussing the FTC appropriation with a House subcommittee recently, Com. Stephen J. Spingarn said it "provides a valuable background for the consideration of the very delicate problems that are now arising in that industry in oversea areas where members of that industry operate." Much of the information, he added, has not been available before, even to members of the Government who are directly concerned with petroleum matters.

The alleged existence of cartels in the world petroleum industry also is expected to be touched upon in another report now in preparation on the experience of various governments with the registration of international cartels. This study was undertaken following establishment by the United Nations Economic and Social Council last year of a committee to prepare a plan for the curbing of harmful cartel practices in international trade.

New Touch of Fire

President Truman's 1953 financial program of high spending and higher taxation has just been lambasted from a quarter which heretofore has strongly supported the administration, the Joint Congressional Committee on the Economic Report.

Chairman of that committee is Sen. Joseph C. O'Mahoney of Wyoming, normally an administration stalwart as evidenced by his unwavering effort to secure the enactment of legislation for federal administration of the tidelands.

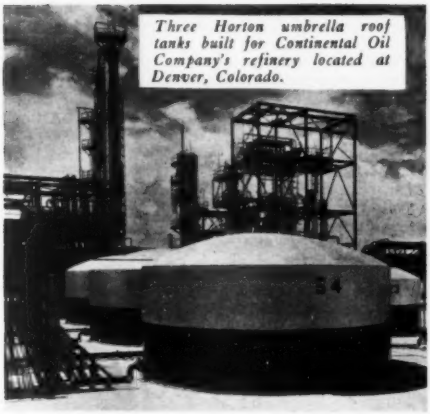
When a man like O'Mahoney says the President's budget should be cut by $10,000,000,000 and no further tax increases should be imposed this year, his words carry weight both in Congress and in administration circles.

While it registered disapproval of any general tax increases, the committee did suggest that Congress get around to the long-delayed revision of the administrative provisions of the tax laws including the closing up of loopholes. President Truman has charged repeatedly that the percentage depletion allowance is a loophole, but the committee got out of that neatly by just referring to loopholes generally and not singling out any particular tax allowance.

Congress is expected to follow the committee's recommendations generally, seeking to reduce expenditures and avoiding any action on taxes. It hasn't done so well, so far, with the first appropriation bill to be submitted, for the Treasury and Post Office departments, but it is aiming at an over-all 10 per cent cut.

HORTON TANKS

cut evaporation losses at CONOCO'S Denver Refinery

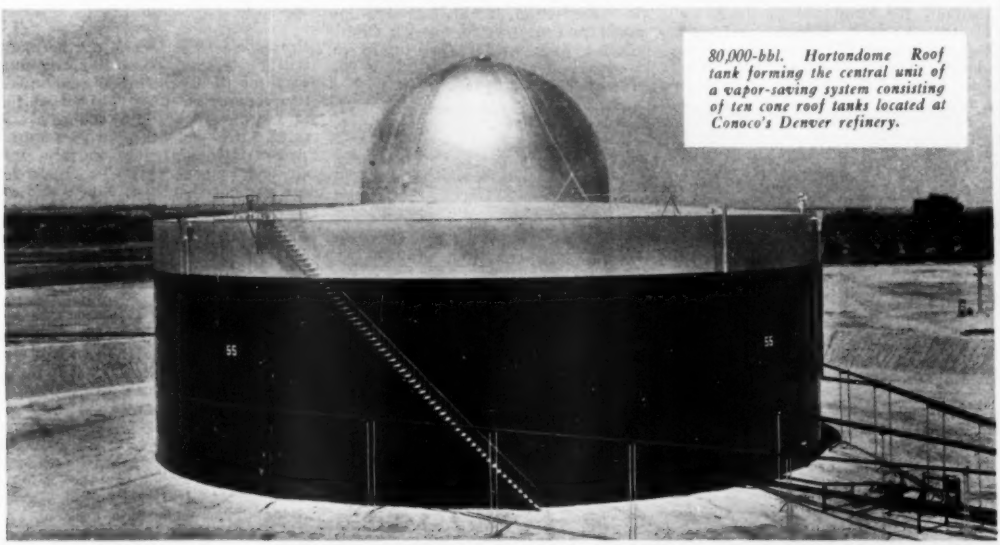


Three Horton umbrella roof tanks built for Continental Oil Company's refinery located at Denver, Colorado.

Continental Oil Company recently installed a large number of Horton welded steel tanks to store base gasoline, Ethyl gasoline, N-tane gasoline, poly gasoline, and demand gasoline at their Denver refinery. These storage units are part of an expansion program designed to double the crude processing capacity of the refinery to 7,500 barrels daily and to improve the quality of the finished gasolines.

This Rocky Mountain plant is typical of many refineries throughout the country that depend on Horton tanks for the storage of crude oil and refined products. The complete line of efficient structures—Hortonspheres, Hortonspheroids, Hemispheroids, Hortondome Roofs, Horton Floating Roofs, Horton Vaporspheres and flat-bottom tanks—has been carefully designed to reduce evaporation losses of volatile hydrocarbons by utilizing modern storage principles.

If you are interested in obtaining the many inherent advantages of modern storage facilities for your refinery, tank farm, or pipe line station, write our nearest office for complete information. There is no obligation on your part.



80,000-bbl. Hortondome Roof tank forming the central unit of a vapor-saving system consisting of ten cone roof tanks located at Conoco's Denver refinery.

CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3.....2154 Healey Bldg.
Birmingham, 1.....1536 North 50th St.
Boston, 10.....1025—201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 C & I Life Bldg.
Los Angeles, 17.....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
Philadelphia, 3.....1615—1700 Walnut Street Bldg.
San Francisco, 4.....1554—200 Bush St.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg.
Washington 6, D. C.....1139 Cafritz Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Chicago Bridge & Iron Company, Ltd., Apartado 1348, Caracas, Venezuela
Comprimo N.V., Amsterdam—O, Netherlands
Compagnia Tecnica Industrie Petroli, Rome, Italy
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Sociedade Chibridge de Construcoes Ltda., Av. Franklin Roosevelt, 194-S/704-C, Rio de Janeiro, Brazil

the end of 1951 are summarized in the bimonthly list of basic materials and alternates issued by the Defense Production Administration in which basic commodities are classified according to their supply-demand situation.

In steel, DPA said, a tendency to ease spottily continues even though scrap supplies remain at low levels. Heat-resistant high-alloy steel, structural shapes, nickel-bearing stainless-steel and seamless tubing are listed as most critical. Welded pipe, 3 in. and under, except galvanized, and hot-rolled sheet and strip are in approximate balance. Cold-rolled sheet and strip and welded-carbon mechanical tubing are among the items in fair to good supply.

All of the ferrous-alloying elements except vanadium are in most critical position, as are aluminum, copper, and tin. The flow of secondary copper has improved slightly, and new foreign contracts have bettered the outlook for tin. Improved imports have helped lead materially.

SOUTHWEST

Permian Sulfur Plants

Facilities now operating and under construction will turn out 250 long tons daily, giving area new industry

Roy F. Carlson

MIDLAND, Tex.—One sulfur plant in operation, several others under construction, and still others planned for construction in the near future give oil operators in the Permian basin a use for a formerly wasted and dangerous byproduct, and give the area another industry.

About 250 long tons of sulfur capacity is now completed or in the building process. The first plant completed is that of Odessa Natural Gasoline Co. and Sid Richardson Carbon Co., a 20-long-ton installation at Odessa Natural's gasoline plant near Odessa, Tex. Nearly completed is the Goldsmith sulfur plant of Phillips Chemical Co. which will process in the neighborhood of 110 long tons of elemental sulfur per day as capacity.

Other plants planned for immediate construction are another Phillips installation at the company's Crane gasoline plant in McElroy field of 45 tons capacity, and one of Gulf Oil Corp. at Gulf's Waddell gasoline plant of about 20 tons per day capacity. Stanolind Oil & Gas Co. also has a plant slated for construction in Slaughter field, said to be about 60-ton capacity. Additional plants may be built at the North Cowden gasoline plant being operated by Stanolind; Phillips' Eunice, N. M., plant; and Sid Richardson Gasoline Co.'s gasoline plant near Kermit, Tex.

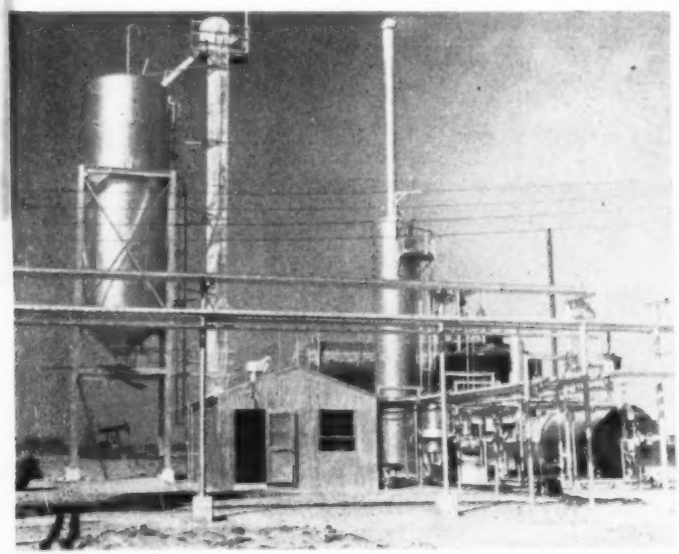
The plants now under construction or to begin building in the near future have a total capacity of about 250 tons of elemental sulfur per day. It is estimated that hydrogen sulfide is available in the Permian basin for the economical production of about 500 long tons per day of elemental sulfur. There is undoubtedly much more sulfur in the area in the form of hydrogen sulfide, but all this would not be profitable to extract because of too small a volume concentration.

All of the plants mentioned will take the hydrogen sulfide from gas sweetening units at gasoline plants where the gas is available in rather large volumes. This makes the sulfur plant an economical operation since extraction of the hydrogen sulfide is done as a part of normal sweetening of field gas before sale to transmission lines. Therefore, the raw material is concentrated in a high-percentage gas stream without any cost to the sulfur extraction plant.

Processes.—Processes in all the plants will be similar, based for the most part on the modified Claus process for conversion of hydrogen sulfide into sulfur. With this system, a one-third portion of the hydrogen sulfide stream is converted by burning with air to sulfur dioxide. The hydrogen sulfide and sulfur dioxide gases are then passed through a bauxite or aluminum oxide catalyst whereupon they react to form elemental gaseous sulfur and water. This sulfur is cooled and condensed into liquid sulfur, and is then either stored and marketed as a liquid or allowed to solidify and shipped as a solid. The plant of Odessa Natural is equipped with a sulfur flaking machine so that sulfur can be shipped in that form if desired.

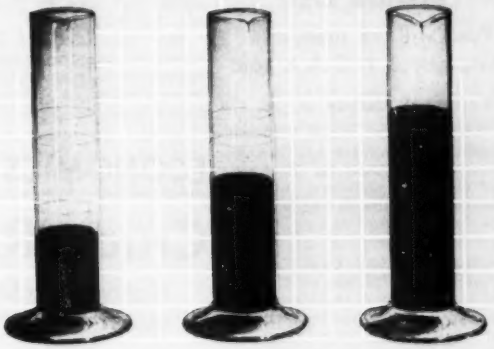
Simple to do.—The process used for sulfur extraction is extremely simple, and requires little moving machinery. The most important of the moving equipment is a blower to furnish air to the hydrogen sulfide burner. The burning furnishes all heat necessary for the reaction, and this is augmented by heat from the reaction itself.

Sulfur produced in the plants is a desirable kind because it is of high purity. A part of the Permian basin's production will be marketed locally for use in the manufacture of fertilizers and insecticides. Other uses to which the sulfur might be put include production of steel, rubber, pulp and paper, chemicals including sulfuric acid, and explosives.



SULFUR PLANT.—The first elemental sulfur to be produced in the Permian basin was manufactured in facilities of Sid Richardson Carbon Co. and Odessa Natural Gasoline Co. The plant is of about 20 long tons per day capacity. Hydrogen sulfide furnace is at far right, and flake sulfur storage is at left. The vertical tower with the stack is used to cool and liquefy the gaseous sulfur, with a horizontal liquid sulfur storage tank shown behind it.

How Visco Quality CUTS YOUR EMULSION-BREAKER COSTS



To Treat the Same Identical Emulsion Required:

3 units of a Visco Class I *high quality* formula.

5 units of a medium-priced emulsion breaker.

7 units of a low-priced emulsion breaker.

In each instance, Visco Class I is the highest-priced chemical—but the lowest in cost per barrel of dry oil!

Quantities above were determined from controlled tests in the field and in the Visco Laboratories. Oil treated contained emulsion which could be satisfactorily broken by all three formulas. This proof of the real economy of Visco Quality formulas is even more dramatic on leases where emulsions encountered are more difficult and sometimes impossible to break with lower grade formulas...

You can put Visco Quality to work on your leases promptly—Call Houston, CAPITOL 7300, collect, for fast action. Remember: By paying too little for treating chemical you may be paying far too much for pipeline oil!

VISCO PRODUCTS COMPANY
INCORPORATED
City National Bank Building
Houston 2, Texas

Visco VS SOLVENT

Visco VS was developed for our own use as a solvent for wax, grease, lube oils, paint, oil-treating chemicals, and fusible or soft resins. It is so powerful it has been made available to the whole petroleum industry! Available now in Will not harm skin, wood or metal. 5-gallon tins and 55-gallon drums.

Visco CONSISTENTLY EFFICIENT DEHYDRATING AND DESALTING CHEMICALS

NOTICE: Visco Products Company is authorized to manufacture and sell Visco Oil Treating Compounds for use in the breaking and resolving of oil emulsions, or to grant licenses for such use, under the following United States Letters Patent: 2,050,639; 2,050,640; 2,396,589; 2,214,783; 2,214,784; 2,225,189; 2,303,414; 2,307,813; 2,318,084; 2,318,085; 2,321,056; 2,336,554; 2,454,808; 2,514,339. Visco Products Company is willing to grant licenses on a royalty basis, to oil companies, and to others desiring to practice the patented subject matter, under any and all of the above Letters Patent, permitting the user to purchase the oil treating compounds at will from any vendor, or to prepare the compounds for use or to use the compounds under the above Letters Patent. Application for license should be made to: **Visco Products Company,** Houston, Texas.

the end of 1951 are summarized in the bimonthly list of basic materials and alternates issued by the Defense Production Administration in which basic commodities are classified according to their supply-demand situation.

In steel, DPA said, a tendency to ease spottily continues even though scrap supplies remain at low levels. Heat-resistant high-alloy steel, structural shapes, nickel-bearing stainless-steel and seamless tubing are listed as most critical. Welded pipe, 3 in. and under, except galvanized, and hot-rolled sheet and strip are in approximate balance. Cold-rolled sheet and strip and welded-carbon mechanical tubing are among the items in fair to good supply.

All of the ferrous-alloying elements except vanadium are in most critical position, as are aluminum, copper, and tin. The flow of secondary copper has improved slightly, and new foreign contracts have bettered the outlook for tin. Improved imports have helped lead materially.

SOUTHWEST

Permian Sulfur Plants

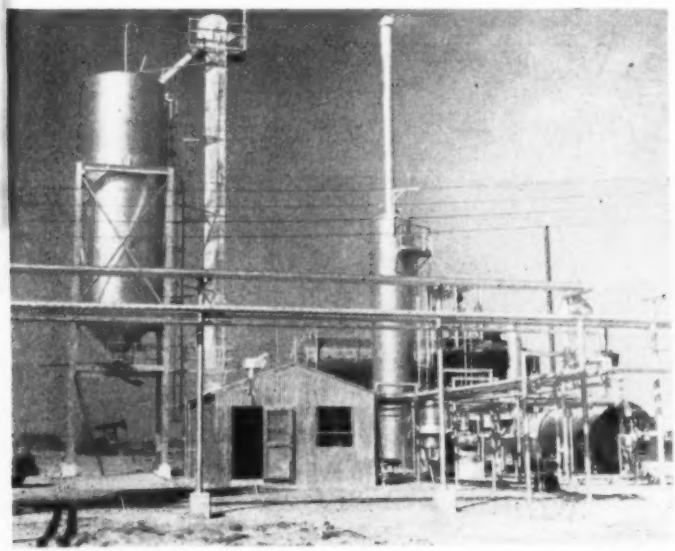
Facilities now operating and under construction will turn out 250 long tons daily, giving area new industry

Roy F. Carlson

MIDLAND, Tex.—One sulfur plant in operation, several others under construction, and still others planned for construction in the near future give oil operators in the Permian basin a use for a formerly wasted and dangerous byproduct, and give the area another industry.

About 250 long tons of sulfur capacity is now completed or in the building process. The first plant completed is that of Odessa Natural Gasoline Co. and Sid Richardson Carbon Co., a 20-long-ton installation at Odessa Natural's gasoline plant near Odessa, Tex. Nearly completed is the Goldsmith sulfur plant of Phillips Chemical Co. which will process in the neighborhood of 110 long tons of elemental sulfur per day as capacity.

Other plants planned for immediate construction are another Phillips installation at the company's Crane gasoline plant in McElroy field of 45 tons capacity, and one of Gulf Oil Corp. at Gulf's Waddell gasoline plant of about 20 tons per day capacity. Stanolind Oil & Gas Co. also has a plant slated for construction in Slaughter field, said to be about 60-ton capacity. Additional plants may be built at the North Cowden gasoline plant being operated by Stanolind; Phillips' Eunice, N. M., plant; and Sid Richardson Gasoline Co.'s gasoline plant near Kermit, Tex.



SULFUR PLANT.—The first elemental sulfur to be produced in the Permian basin was manufactured in facilities of Sid Richardson Carbon Co. and Odessa Natural Gasoline Co. The plant is of about 20 long tons per day capacity. Hydrogen sulfide furnace is at far right, and flake sulfur storage is at left. The vertical tower with the stack is used to cool and liquefy the gaseous sulfur, with a horizontal liquid sulfur storage tank shown behind it.

The plants now under construction or to begin building in the near future have a total capacity of about 250 tons of elemental sulfur per day. It is estimated that hydrogen sulfide is available in the Permian basin for the economical production of about 500 long tons per day of elemental sulfur. There is undoubtedly much more sulfur in the area in the form of hydrogen sulfide, but all this would not be profitable to extract because of too small a volume concentration.

All of the plants mentioned will take the hydrogen sulfide from gas sweetening units at gasoline plants where the gas is available in rather large volumes. This makes the sulfur plant an economical operation since extraction of the hydrogen sulfide is done as a part of normal sweetening of field gas before sale to transmission lines. Therefore, the raw material is concentrated in a high-percentage gas stream without any cost to the sulfur extraction plant.

Processes.—Processes in all the plants will be similar, based for the most part on the modified Claus process for conversion of hydrogen sulfide into sulfur. With this system, a one-third portion of the hydrogen sulfide stream is converted by burning with air to sulfur dioxide. The hydrogen sulfide and sulfur dioxide gases are then passed through a bauxite or aluminum oxide catalyst whereupon they react to form elemental gaseous sulfur and water. This sulfur is cooled and condensed into liquid sulfur, and is then either stored and marketed as a liquid or allowed to solidify and shipped as a solid. The plant of Odessa Natural is equipped with a sulfur flaking machine so that sulfur can be shipped in that form if desired.

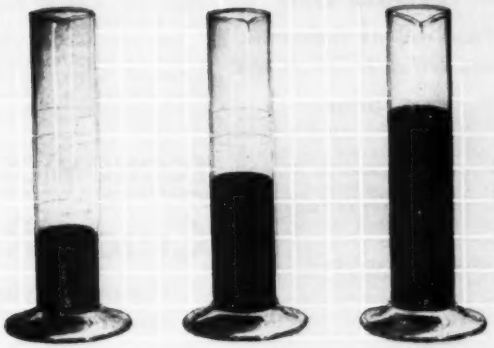
Simple to do.—The process used for sulfur extraction is extremely simple, and requires little moving machinery. The most important of the moving equipment is a blower to furnish air to the hydrogen sulfide burner. The burning furnishes all heat necessary for the reaction, and this is augmented by heat from the reaction itself.

Sulfur produced in the plants is a desirable kind because it is of high purity. A part of the Permian basin's production will be marketed locally for use in the manufacture of fertilizers and insecticides. Other uses to which the sulfur might be put include production of steel, rubber, pulp and paper, chemicals including sulfuric acid, and explosives.

How

Visco Quality

CUTS YOUR EMULSION-BREAKER COSTS



To Treat the Same Identical Emulsion Required:

3 units of a Visco Class I *high quality* formula.

5 units of a medium-priced emulsion breaker.

7 units of a low-priced emulsion breaker.

In each instance, Visco Class I is the highest-priced chemical—but the lowest in cost per barrel of dry oil!

Quantities above were determined from controlled tests in the field and in the Visco Laboratories. Oil treated contained emulsion which could be satisfactorily broken by all three formulas. This proof of the real economy of Visco Quality formulas is even more dramatic on leases where emulsions encountered are more difficult and sometimes impossible to break with lower grade formulas...

You can put Visco Quality to work on your leases promptly—Call Houston, CAPITOL 7300, collect, for fast action. Remember: By paying too little for treating chemical you may be paying far too much for pipeline oil!

VISCO PRODUCTS COMPANY
INCORPORATED
City National Bank Building
Houston 2, Texas

Visco VS SOLVENT

Visco VS was developed for our own use as a solvent for wax, grease, lube oils, paint, oil-treating chemicals, and fusible or soft resins. It is so good, it has been made available to the whole petroleum industry! Will not harm skin, wood or metal. Available now in 5-gallon tins and 55-gallon drums.

Visco CONSISTENTLY EFFICIENT DEHYDRATING AND DESALTING CHEMICALS

NOTICE: Visco Products Company is authorized to manufacture and sell Visco Oil Treating Compounds for use in the breaking and resolving of oil emulsions, or to grant licenses for each use, under the following United States Letters Patent: 2,050,639; 2,050,640; 2,206,589; 2,214,783; 2,214,784; 2,225,189; 2,303,414; 2,307,813; 2,318,084; 2,318,085; 2,323,056; 2,335,554; 2,454,808; 2,514,399. Visco Products Company is willing to grant licenses on a royalty basis, to oil companies, and to others desiring to practice the patented subject matter, under any and all of the above Letters Patent, permitting the user to purchase the oil treating compounds at will from any vendor, or to prepare the compounds for use or to use the compounds under the above Letters Patent. Application for license should be made to: **Visco Products Company,** Houston, Texas.

New Turbine Use

El Paso will use them as prime mover, N.G.A.A. told

Roy F. Carlson

ODESSA, Tex.—Use of gas turbines as prime movers for centrifugal compressors is planned by El Paso Natural Gas Co., members of the Permian basin section of the Natural Gasoline Association of America were told here last week.

Preliminary estimates, Carlton Homan of El Paso Natural Gasoline Co. said, indicate that the regenerative-cycle design gas turbines which are to be installed in the new compressor stations, and which incorporate an independent load turbine, are well adapted to driving the centrifugal compressors.

The turbine's characteristics, he said, permit the load turbine to operate over a wide range of operating pressures and temperatures without sacrificing much of the turbine's load-carrying ability. It also permits overloading the turbine in winter months when the transmission line must be operating to capacity.

Sulfur discussed.—West Texas' newest industry—production of elemental sulfur—also came in for discussion. C. L. Blohm, assistant manager, research and development, Fluor Corp., Ltd., Los Angeles, observed that recovery of sulfur from waste hydrogen sulfide gases has achieved a position of importance in the present-day sulfur economy.

He described the process for extraction of elemental sulfur, reviewed its development, and discussed economics of sulfur production. The number of sulfur-conversion units that have recently been constructed or planned has demonstrated their attractiveness, both economically and as an important measure for the conservation of a dwindling natural resource, Blohm said.

N.G.A.A. members were taken on a tour of the newly completed sulfur plant of Odessa Natural Gasoline Co. and Sid Richardson Carbon Co. during the meeting.

Steel Accounting Asked

AUSTIN.—A resolution has been passed by the executive committee of Texas Independent Producers and Royalty Owners Association asking that Petroleum Administration for Defense direct all steel mills to make an accounting of all oil-country tubular goods milled in the last half of 1951.

Tipro executives said the action was taken because of a growing belief that all steel tubular goods for the oil industry may not be subject to defense allocation and implied that some steel may be finding its way into the gray market.

The committee sent a second resolution to the House small business committee to recommend to the Defense Production Authority that sufficient steel be allocated to PAD to enable the accomplishment of the proposed domestic oil-expansion program. The House group is currently investigating the oil-industry steel-allocations program.

The sixth annual Tipro meeting will be held in Fort Worth March 27-28.

ECONOMICS

Crude Record Expected

Higher allowables indicate March production will average about 6,420,000 bbl. daily, including lease condensate

John C. Casper

CRUDE production in March, based on allowables that have been announced, will set a new all-time record.

Also, stocks of domestic crude at the end of the month will be at least 25,000,000 bbl. greater than at the end of the first quarter last year.

Weekly estimates of crude and lease-condensate production for February averaged about 6,360,000 bbl. daily or about 15,000 bbl. daily less than the record of 6,375,000 bbl. daily, established last October.

Allowables for fields in Texas for March 1 are about 50,000 bbl. daily greater than for February 1. Louisiana and Oklahoma have announced small increases in March allowables. From these, it is estimated that average production in the United States during March will be at least 60,000 bbl. daily more than February. This extra production will push the March average for crude and lease condensate to about 6,420,000 bbl. daily.

Refinery outlook.—If crude imports for this month continue at the February rate of about 460,000 bbl. daily, new crude supply for the month will reach 6,880,000 bbl. daily. Crude exports, transfers, and losses amount to about 110,000 bbl. daily, leaving 6,770,000 bbl. daily for runs at refineries.

Unless colder-than-normal weather in March sustains fuel demands at near winter levels, there will be little need for increasing refinery runs over the February rate. Last year, runs in March were almost 100,000 bbl. daily less than in February. Even allowing for an increase in runs to 6,630,000 bbl. daily, inventories of domestic crude will accumulate at the rate of 140,000 bbl. daily or a little better than 4,000,000 bbl. for the month.

Storage picture.—Current reports indicate that crude stocks climbed faster in February than is shown by weekly company reports to the Bureau of Mines.

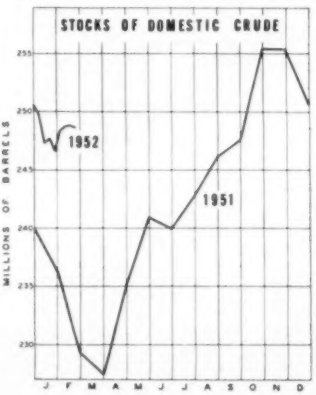
Production of crude and lease condensate for the 3-week period ended February 23 averaged about 6,360,000 bbl. daily. Refinery runs of domestic crude, according to weekly A.P.I. reports, averaged 6,084,000 bbl. daily for the same period. Allowing 110,000 bbl. daily for crude exports, transfers, and losses, leaves 166,000 bbl. daily for additions to crude inventories, or about 3,500,000 bbl. for the 3-week period. Weekly stock reports by the Bureau of Mines show a total gain of only 335,000 bbl. for domestic crude for the period.

Correcting for this extra addition to storage in February, domestic crude inventories at the end of the month are estimated at about 251,000,000 bbl. If 4,000,000 bbl. more are placed in storage during March, inventories at the end of the month will reach 255,000,000 bbl. This total would be about 28,000,000 bbl. greater than domestic crude inventories at the end of the first quarter last year.

If stocks of foreign crude, now running between 6,000,000 and 7,000,000 bbl., are added to the above inventories of domestic crude, the forecast for total crude stocks on March 31 amounts to almost 262,000,000 bbl.

This is at the upper limit of the desirable range for working inventories, reported by representatives of major producers in Texas late in 1950.

With no need for further additions



to crude inventories, crude production in the second quarter can be based on demand. In the second quarter of 1951 almost 140,000 bbl. daily of production was needed to rebuild crude stocks to desirable working levels. This should be considered when production figures for the second quarter of this year are compared with last year's data.

Price Rise Asked

Crude price hike essential to expansion, I.P.A.A. says

WASHINGTON. — Elimination of price ceilings on crude oil and natural gas was asked of the Office of Price Stabilization last week by the Independent Petroleum Association of America.

At the same time, the I.P.A.A. filed a statement in support of decontrol with the Senate banking committee and asked an opportunity to testify during the committee's current hearings on extension and revision of the Defense Production Act.

In a brief submitted to OPS the association contended the present price ceilings on crude oil and natural gas are unnecessary, inequitable, and impractical to administer and the lifting of controls is necessary to promote the national defense.

The association pointed out that there has been no over-all general increase in petroleum prices since 1947 and so oil prices have not contributed to the inflationary trend since the outbreak of fighting in Korea. On the other hand, it said, the general level of wholesale prices has risen more than 11 per cent since June 1950.

At the same time, crude oil and natural gas are in ample supply to meet current national requirements with an unused margin of reserve productive capacity, the association said, whereas other critical materials are in immediate short supply, are being allocated and, without restrictions, would be subject to inflationary price increases.

At the same time, OPS was warned, the situation "does not warrant complacency" and there is an urgent need for a greatly expanded program of petroleum exploration and development, which is being sponsored by the Petroleum Administration for Defense.

The need for expansion has also been recognized by other government agencies, including the military and the National Security Council, the I.P.A.A. said, but present price controls make it impossible to accomplish the big program contemplated.

To provide the funds necessary for the expansion proposed by PAD, it was indicated by a chart prepared by the association, the price of crude oil, now averaging $2.56 per barrel, would have to be increased to an average minimum of $2.98 per barrel this year and $3.28 per barrel in 1953, and to higher levels in the event of increased costs and higher taxes.

Income estimated. — The association estimated the total income from crude production, based on current prices, will be $5,940,000,000 this year and $6,250,000,000 in 1953 and said the minimum income required to finance the necessary expansion is $6,910,000,000 this year and $8,000,000,000 next year.

The association pointed out that price is a matter over which the domestic producer has no control, as he does not fix the price received for crude oil and natural gas.

"With decontrol," OPS was told, "this would again be a function of a competitive economy. Operating under this system the industry has never failed to provide ample petroleum supplies for all needs at reasonable prices to the consumer."

Products Exports Drop

WASHINGTON.—Exports of major petroleum products dropped to an average of 156,900 bbl. daily during the week ended February 8, according to preliminary figures issued by the Petroleum Administration for Defense.

Unless changed by belated reports, this will be the lowest export level recorded by PAD since it began the compilation of weekly figures late last year.

The February 8 report showed a sharp reduction in exports of aviation gasoline and distillate as compared with the preceding week but a sharp increase in residual. For the second successive week no exports of kerosine were reported.

Average daily exports of the several products for the week ended February 8 compared with the preceding week and the average for 4 weeks ended February 8, in thousands of barrels, were as follows:

	Feb. 8	Feb. 1	4 Weeks ended Feb. 8
Aviation gasoline	26.7	65.4	46.2
Motor gasoline	15.1	0.1	14.6
Kerosine	0	0	19.9
Distillate	34.5	63.9	59.3
Residual	80.6	44.3	49.1
Total	156.9	173.7	189.1

Oil Import Quotas Set

WASHINGTON.—The Bureau of Customs has made a final determination that the quota of crude, topped crude, and fuel oil importable this year at the reduced tax rate of 10½ cents per barrel will be 4,977,848,000 gal. The 1951 quota was 4,399,220,700 gal. Both quotas represent 5 per cent of the oil processed in refineries in the continental United States in the preceding year.

Under the division of the quota by areas of origin, Venezuela is given 2,956,841,949 gal. against 2,613,137,096 gal. last year, the Netherlands 930,857,651 gal. against 822,654,271 gal., and all other countries 1,090,148,800 gal. against 963,429,333 gal.

ROCKY MOUNTAIN

Gulf Enters Nevada Search

ELKO, Nev.—Gulf Oil Co. has announced that it will enter the search for oil in northeastern Nevada this spring. A company official said it is planned to spend about $3,500,000 in Nevada exploration during the next 3 years.

Just where its first wildcat will be drilled was not announced. The company, however, has leased 1,400 acres from the town of Wells and has acquired leases on a number of large ranches in the Metropolis and Starr Valley areas near the Idaho border.

Companies engaged in the Nevada land play say that practically the whole of northeastern Nevada is under lease. More than 1,000,000 acres reportedly have been leased during the past 3 months in Elko and White Pine counties.

Only wildcat currently under way is that of Continental Oil Co. and Standard Oil Co. of California in the Summit Springs area 125 miles south of Elko. Last reported fishing at 10,122 ft., the wildcat is the third joint venture of the two companies in White Pine County.

Colorado Gets New Oil Laws

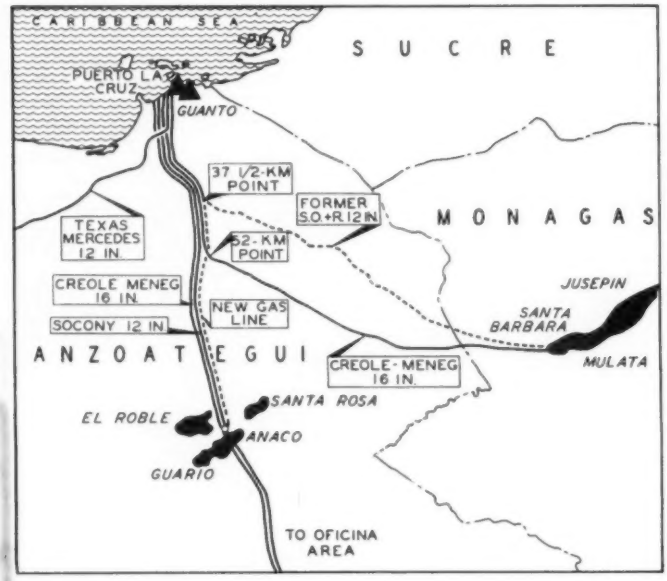
DENVER.—Two new measures, provisions of which tend principally to limit the power of the Colorado Oil and Gas Conservation Commission, have been signed into law by Gov. Dan Thornton.

New legislation prevents the commission from setting up a no-drilling zone around any specific spacing-pattern area, requires that spacing be on a field or unit basis rather than state wide, and orders that no commissioner may take part in proceedings before the commission in which he has a financial interest.

The commission was given jurisdiction to rule on the drilling of offset wells.

Waste, as applied to gas escaping from producing wells, is redefined to permit use of gas from wells producing both oil and gas when it is used for developing power to operate the wells Gas freed from such wells in amounts that are not excessive or unreasonable is not waste, the law says.

Colorado's 1 mill per barrel production tax was extended to cover production from leases on federal lands. This tax, assessed to defray operating expenses of the commission, previously applied only to production from state and private lands.



LATIN AMERICA

New Gas System

Eastern Venezuela Gas Transport's line will move fuel from Anaco, Santa Rosa, Roble area to Puerto La Cruz

Dahl M. Duff

FIRST deliveries of natural gas for industrial use in the Puerto La Cruz area will be made in May by the new Eastern Venezuela Gas Transport Co.

The company is owned by Gulf Oil Corp., Creole Petroleum Corp., and International Petroleum Co., Ltd. The gas will be moved from the Anaco, Santa Rosa, Roble area through a relaid former 12-in. oil line.

The Eastern Venezuelan system is the second transmission line built in the country in the last few years. It reflects the efforts currently being made by the operating oil companies to provide an outlet for natural gas now flared. Large quantities of gas are being taken in repressuring projects, and chemical and fertilizer plants using gas have been under study.

The Venezuelan Atlantic Transmission Co. line in Central Venezuela is nearing completion and is due to go into operation later this spring. This 195-mile line will serve markets in Caracas, La Guaira, Arrecife, Maracay, and Valencia. The company is backed by Atlantic Refining Co., the E. Holley Poe organization, and local Venezuelan capital.

The new gas-transmission line in eastern Venezuela is expected to move initially about 20,000,000 cu. ft. daily using well-head pressures in lieu of compression. The gas will be utilized by the two refineries at Puerto La Cruz and by a cement mill at nearby Guanta. Roughly, about 9,000,000 cu. ft. is expected to be taken by the Venezuelan Gulf Refining Co. plant at Puerto La Cruz, about 6,000,000 cu. ft. by the Sinclair Oil & Refining Co. plant, and the remainder at the Guanta cement works.

Old line bought.—To carry out the project and obtain pipe for the line, Creole and Mene Grande bought Sinclair Oil & Refining's 12-in. crude line which runs from the Santa Barbara area to Puerto La Cruz. At the same time, Sinclair acquired a third interest in the Creole-Mene Grande 16-in. which also extends from the Santa Barbara area to Puerto La Cruz. This 16-in. is sufficient to carry all the current production.

The Sinclair 12-in., which is approximately 100 miles in length, was in turn acquired by the newly organized gas company. That section of the line from Puerto La Cruz to Km. 37½—where it turns eastward toward Santa Barbara—was bought in place. Enough of the pipe was relaid from this point southward to the Anaco area, a distance of 62 miles.

Williams Brothers had the contract for relocating the line, and work has now been completed. By May, the other necessary equipment, including valves, regulators, and scrubbers, will be installed to permit beginning of gas service.

Markets.—The industrial gas requirements of the two refineries and the cement works appear to be all the important, immediate market possibilities in this part of eastern Venezuela. The system is, of course, available to serve other consumers as needs develop. The question of utilization of gas from the many high-ratio wells in eastern Venezuela has often in the past been associated with its possible movement south to the iron-ore development on the Orinoco River. However, it seems that any utilization of gas in this connection is at least several years in the future.

The converted gas line is one of a cluster of pipe lines running into Puerto La Cruz which is an important shipping point for crude and products. Other pipe lines to Puerto La Cruz include the two Creole-Mene Grande 16-in., the Socony-Vacuum 12-in., the Texas 12-in. leading from the Las Mercedes area to the southwest, and two water pipe lines serving the refineries.

Mene Grande In Lead

Mene Grande Oil Co., C. A., is the leading operator in Venezuela from the standpoint of drilling activity.

Tabulations as of the end of January show that Mene Grande was running 32 out of the total of 110 rigs active in Venezuela. Next was Shell, with a total of 31 rigs in operation.

Other operators and the number of rigs running were: Creole 16, Texas 2, Mercedes 6, Phillips 5, Richmond 2, Sinclair 6, Socony-Vacuum 6, and Atlantic 4.

Mene Grande also had the greatest number of wildcat-drilling operations under way. This company was shown as having eight rigs on exploratory ventures. Others with wildcat operations and the number of rigs running in this category were: Creole two, Texas one, Mercedes two, Socony-Vacuum one, Sinclair two, and Shell two.

More Wells in '52

Mexico hopes to drill 450 this year, up 60 per cent

ABOUT 60 per cent more wells will be drilled in Mexico this year, if sufficient materials and equipment can be obtained.

Antonio J. Bermudez, director general of Petroleos Mexicanos, said in Dallas last week that the Mexican oil agency hopes to see 450 wells drilled before the end of the year, as compared with 1951's total of 267.

However, to accomplish this goal, he said, the country must have more drilling equipment and an increased allocation of oil-country tubular goods from the U. S. Petroleum Administration for Defense. Current supplies of pipe are only good for 120 wells.

Independents' gain.—Bermudez spoke before a large group of United States oil men at a luncheon in Dallas held in his honor by J. B. O'Connor, executive vice president of Dresser Industries, Inc. He pointed out that an increasing percentage of wells are being drilled in Mexico by independent operators. Last year the figure amounted to 41 per cent, the remainder being drilled by Pemex. Currently, there are 111 drilling and workover rigs involved in drilling and exploration work in Mexico, as well as 44 seismic crews in the field.

Pointing to progress made by the Mexican oil industry since 1946, Bermudez said production has increased 56 per cent to 230,000 bbl. daily, while domestic consumption has risen from 80,000 bbl. daily to a current figure of about 155,000 bbl. daily. Refining capacity in the same period has increased from 160,000 to 223,000 bbl. daily. Plans call for modernization of existing facilities and construction of five new plants—three on the west coast and one each in the northern and southern parts of the country.

Other Pemex officials attending the luncheon were Jose Colomo, assistant manager; Alfonso Barnetche, manager of production; and Jose Rodriguez Aguilar, manager of exploration.

Operating Contract Signed

Williams Brothers has signed a contract to operate during the next 4 years the 87-mile, 6⅝-in. products pipe line which the company is now completing from Pto. Salgar to Bogota in Colombia.

The operating contract was signed with the Colombian State of Cundinamarca, for which the line is being built. During the 4 years, Williams Brothers will receive as fee $4,500 plus costs monthly, and will train Colombian nationals in the pipeline operation.

The line is scheduled to go into operation the middle of April. Pto. Salgar on the Magdalena River receives products from the Barrancabermeja refinery of Empresa Colombiana de Petroleos. This Colombian Government company is planning construction of a 91-mile line from Salgar to Cantimplora which with an existing line will provide pipe-line transportation the entire distance from Barrancabermeja to Salgar, and thence to Bogota.

The economic advantage of pipeline transportation has been again shown in the tariffs filed by the State of Cundinamarca for the Salgar-Bogota line. The Colombian capital has been dependent for its oil supply on overburdened rail and truck transportation. By this method, cost of hauling motor fuel between the two points amounts to the equivalent of 4.4 cents for gallon or about $1.85 a barrel.

With the pipe line at a throughput of 4,000 bbl. daily and considering the costs established over the 10-year amortization period, transportation will be about 58 cents a barrel, or less than a third of that using rail and truck facilities. The Bogota market now consumes some 3,000 bbl. daily of gasoline and about 1,000 bbl. daily of other products.

Peruvian Oil Law O.K.'d

The new Peruvian petroleum law *(The Oil and Gas Journal, March 3, 1952, page 63)* has been approved by the senate in Lima and sent back to the chamber of deputies with only a few minor amendments.

After the changes have been agreed on, the measure will go to President Manuel Odria for proclamation as law. Supporters of the bill contend it will bring foreign capital into renewed exploration and development. However, the tax provisions make the terms considerably less attractive to foreign operators than some of the law's enthusiastic advocates seem to believe.

MIDDLE EAST

Settlement Possible

Hopes high that Iran and Britain may reach accord

INCREASED possibility of a temporary settlement of the Iranian oil-nationalization question was indicated this week as a result of efforts of the International Bank for Reconstruction and Development.

Bank officials who earlier were in Teheran held high-level conferences in London with British Government officials, including Foreign Secretary Anthony Eden. George Middleton, British charge d'affaires in Iran, participated in these meetings and subsequently returned to Teheran for further discussions with Iranian Prime Minister Mossadegh.

Details of what agreement the bank is attempting to work out were not known. However, the conferences in London and Teheran tended to confirm industry reports that the positions of the two sides are gradually being brought together.

These reports said there appears to be almost no prospect of a return to British operation of the properties of Anglo-Iranian Oil Co., Ltd. It was said the views of the Iranians and the British on the matter of price may be reconciled to a compromise figure at which the oil would be purchased from the nationalized operation. Whatever price is finally agreed on would be of utmost significance since it certainly would be compared by other countries, such as Iraq, to the total amount which they receive under negotiated 50-50 profit-sharing agreements.

Hungary makes deal.—In Budapest, the Hungarian Government confirmed the conclusion of a commercial agreement with Iran. Oil was included among the goods which Iran will furnish Hungary in a trade exchange. In Rome, the director-general of an independent Italian refining company, Soc. Anonima Petroli Italiana, said proposals made to the company that it buy Iranian oil had been rejected as not being of "commercial value." The offers of Iranian crude had been made through intermediaries.

The apparently growing financial stringency of the Iranian Government was borne out by a report from Teheran that government offices in Teheran were being stripped of Persian carpets which were being sold to raise money. The government also was selling a large number of its automobiles.

Port Authority Income Drops

The prolonged shutdown of the Abadan refinery has seriously cut into the income of the Basra Port Authority but increasing traffic to Fao will provide a substantial amount of offsetting revenue.

The port authority maintains the channel and the approaches to the Shatt-el-Arab River which provides access from the Persian Gulf to Abadan, Khorramshahr, Basra, and Fao. Formerly it received the equivalent of about $2,800,000 annually from charges assessed tankers calling at Abadan.

As a result of this loss of most of its income, the authority recently made an increase of 50 per cent in its basic rates on other shipping using the river. Among the vessels affected are the tankers going to Iraq Pe-

troleum Co., Ltd.'s, new two-berth terminal at Fao. This terminal, opened in December, is the shipping point for crude from Zubair field in Iraq.

Even with the latest increase, the Basra port is expected to operate at a gradually decreasing deficit the next 5 years. By that time Fao traffic and the growing merchant-ship use of the river should bring operations into financial balance.

The Shatt-el-Arab, which is the combined Tigris and Euphrates rivers, is Iraqi territory all the way to the Iranian shore of the river. This accounts for the maintenance of navigation facilities by the Basra authority, which is in Iraq.

Trade Agreement

Syria, Lebanon to grant equal pipe-line facilities

IN a newly concluded trade agreement, the Syrian and Lebanese governments have agreed to follow similar policies with regard to foreign oil companies and to grant equal facilities for pipe lines.

Neither country has any production but both are important since they are crossed by pipe lines carrying Middle East crude to the eastern Mediterranean. Iraq Petroleum Co., Ltd., explored in both countries without success. In 1949 it abandoned a deep wildcat near Tripoli, and last year discontinued work in Syria after spending the equivalent of about $17,000,000.

It was reported early in February that the companies with interests in Lebanon—principally Iraq Petroleum and Trans-Arabian Pipe Line—were negotiating with the government in Beruit on revision of their agreements. The Syrian - Lebanese treaty presumably means that any additional benefits obtained by Lebanon also would have to be granted to Syria.

Line routes.—Tapline's 30-31-in. from Saudi Arabia runs across Jordan, Syria, and Lebanon to the terminal at Sidon south of Beruit in Lebanon. Last year Tapline moved an average of 294,531 bbl. daily. Lebanon receives $110,000 annually for the right-of-way, about $70,000 annually for expenses in guarding the line, and 2 cents a ton for oil loaded at Sidon.

I.P.C.'s north branch 12 and 16-in., moving about 160,000 bbl. daily, terminates at Tripoli, north of Beruit, where the company operates a 10,000-bbl. daily refinery. The company's 30 and 32-in., to go in initial operation in April, skirts north of Lebanon to a terminal at Banias, Syria, just north of the Syria-Lebanon border.

Caltex to build plant.—Another company interested in Lebanon is the Caltex organization which is planning the construction of a 13,000-bbl. daily refinery at Sidon to operate on Tapline crude. The initial plant is reported to be the first step toward construction of a possibly much larger installation. Negotiations are under way for acquisition of the necessary land site.

Aside from the agreement regarding joint policies toward oil companies, the new Syrian-Lebanese treaty provides for complete freedom in trade between the two countries in animal and agricultural products, provided they are of local origin. Imported goods of this type will be subject to a minimum common tariff. The agreement permits, in principle, exchange of locally manufactured products and makes specific provisions with regard to goods partly of local origin.

International Briefs

A new apparatus for testing strength of roads under moving loads, invented at the Royal Dutch-Shell laboratories in Amsterdam, was shown for the first time at the recent International Road Congress in Lisbon, Portugal. The equipment sets up a testing force up to 2,000 kg. by revolving eccentric masses. The vibrations are measured using an electronic voltmeter and a vibration recorder coupled to a cathode-ray oscilloscope.

Azienda Generale Italiana Petroli's new natural gasoline plant is scheduled to go in operation this month at Cortemaggiore field in northern Italy. The plant has a capacity to handle 100,000,000 cu. ft. daily and in addition to 35 billion cubic feet annually of dehydrated natural gas, will produce propane, butane, gasoline, and other distillates. Facilities are of the absorption type using the pressure drop of the gas for refrigeration of the absorbent. The contract was held by Northern American Petroleum Gas Corp., New York, which subcontracted the project to J. F. Pritchard & Co., Kansas City.

The continued growth of the use of petroleum as the fuel for world shipping is reflected in the changes shown in the new tables of Lloyd's Register published in England. Based on entries as of last July, these list oil as the fuel for 83 per cent of the total steam and motor tonnage compared with 81 per cent a year earlier. The tables also show that of 1.128 vessels between 10,000 and 20,000 tons in service as of mid-1951, 818 were tankers.

Butane has been used for the first time as a municipal gas supply in Britain. The coal gas distributed to consumers at Whitland, Carmarthenshire, South Wales, was recently replaced by a butane-air supply. Liquid butane is being furnished in high-pressure containers from Anglo-Iranian Oil Co., Ltd., Llandarcy refinery. In the first day, the butane-air plant produced a day's supply of gas for Whitland in 3 hours compared to the usual 18 hours daily operation of the coal-gas plant.

Construction continues to move forward rapidly on the 60,000-bbl. daily refinery of Anglo-Iranian Oil Co., Ltd., on the Isle of Grain in Kent, England. The main distillation tower is up, and has been successfully tested by air pressure and by X-ray of the seams. Sheet steel for the tower was brought from the United States. The plant is to go into initial operation sometime this spring. Its construction was accelerated after the shutdown of the Abadan refinery.

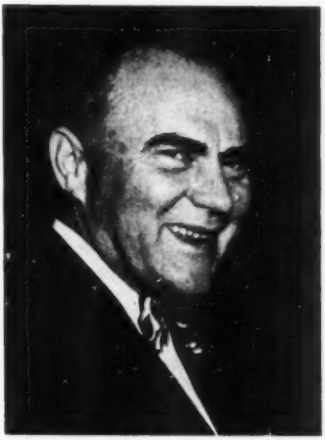
Storage tanks and loading facilities of Regent Oil Co., Ltd., at Avonmouth, England, which were destroyed by fire last September, are now being rebuilt. The new layout for reconstruction provides for each tank to have its own fire wall and for maximum production of pipe lines.

Butangas, Italian chemical and L.P.G. company, is planning to build a petrochemical plant on part of the site formerly occupied by the Caproni Aeroplane factory in Milan. Facilities will include storage for liquid fuels and installations for the manufacture of solvents and detergents. Equipment and machinery will be entirely of Italian design and manufacture, according to a report from Milan.

The trans-Arabian pipe line from Saudi Arabia to Sidon, Lebanon, during January moved an average of 306,160 bbl. daily. Since November 20, the line has been operating at 100 per cent capacity. January loadings at Sidon averaged 307,175 bbl. daily into a total of 85 ships. Average per ship was 112,029 bbl., and average loading time, 7 hours and 17 minutes. Average loading rate during the month was 15,382 bbl. per hour, and average time in port for each ship was 18 hours and 3 minutes.

The New York office of the United States commission representing the Argentine Government Oil Fields, Yacimientos Petroliferos Fiscales, has moved to new quarters in the Empire State Building, 350 Fifth Avenue, New York 1. The commission, which is in charge of Abel O. Malvestiti and Teobaldo R. Manrique, has been at Pier 25, North River. The offices of the maritime agent, Edward L. Wynne, are remaining at 80 Broad Street, New York.

PERSONALS



Active Career

H. H. Johnson completing 32nd year in oil industry

A VARIED career in the petroleum industry, the military forces, and in peacetime public service is the background of Harry H. Johnson, president of Algonquin Gas Transmission Co.

Johnson was elected to head the New England gas company and appointed a member of the board of directors a year ago. He is now completing his thirty-second year in the petroleum industry, the first 31 of which were spent in the employ of Gulf Oil Corp.

Born in Glenfora, Tex., on April 11, 1895, Johnson attended business college for 8 months and Texas A. & M. College for 2 years.

After working for 1 year in the accounting department of Southern Pacific Railroad, he entered the army in 1917 as a private. After his discharge in 1919, he went to work in the commissary department of Gulf Production Co.

After many promotions he was transferred to Houston in 1935 and placed in the executive department to handle joint operations for the Houston division of Gulf Oil Corp. He was subsequently promoted to assistant to the vice president to supervise joint operations, warehousing, and purchasing. He was chairman of the analyses committee to study and effect economy in the company's producing operations.

He reentered the army in 1940 and during World War II served as commander of the 2nd Cavalry and 93rd Infantry divisions and as military governor of Rome. He left active service as a major general and currently is commanding general of the reserve 22nd Armored division.

He rejoined Gulf in August, 1946, and in May, 1948, he was granted a leave of absence from his position as assistant to the vice president, supervising joint operations in the Houston division of the firm, to undertake public service in Mexico.

For 3 years he led a victorious campaign as codirector of the Mexico-United States Commission for Eradication of Hoof-and-Mouth Disease.

As the disease neared total eradication, he tendered his resignation on April 6, 1951. The following month he was elected to head Algonquin.

Last June he was appointed a member of the gas-industry advisory council by Oscar Chapman, secretary of the interior.

H. L. Hoover, party chief for The Texas Co., has been transferred from Brownfield, Tex., to Houston as seismologist.

W. Vaughn Ischie, of Hammond, Ind., operating superintendent of the East Chicago refinery of Sinclair Refining Co., has been named director of the foreign refining division of the Petroleum Administration for Defense. Ischie, who has been deputy director of the division since early last month, succeeds **George T. Ballou,** who is returning to his post as executive assistant to the chairman of Calmera Oil Co. after a year's duty with PAD.

Robert V. Thiede, formerly engineer in the operations-analysis department at Esso Standard Oil Co.'s Bayway refinery at Linden, N. J., has been transferred to the cracking division as technical assistant. **John G. Schreiber** has been promoted to head the oil-movement and storage division, succeeding **D. J. Hauenstein,** retired. His assistant will be **Williard N. Thompson.**

Harold A. Lacik, formerly petroleum engineer for British American Oil Co. at Casper, Wyo., has joined Warren Oil Corp. at Abilene, Tex., as division petroleum engineer.

Ira H. Cram, vice president in charge of exploration for Continental Oil Co., has been elected a director of the firm. Cram was with Pure Oil Co. for 25 years prior to joining Conoco in 1949. He is a past president of the American Association of Petroleum Geologists. As a director he succeeds **W. H. Ferguson,** Denver, who retired after serving as executive vice president and board member for nearly 30 years. Ferguson will continue to serve the company in an advisory capacity.

Charles A. Perlitz, Jr., Houston, vice president and director of Continental Oil Co., will relinquish his duties as general manager of the company's southern region April 1 to join Continental's executive-headquarters staff in Houston. In his new position, Perlitz will be in charge of transportation, crude-oil trading, purchasing, and public-relations activities. In addition, he will serve as chairman of the company's financial-advisory committee and act as liaison with subsidiary and affiliated pipeline companies.

O. L. Fisher, Houston, assistant general manager of the southern region of Continental Oil Co., has been named general manager of the revised southern region. **K. W. Brill,** exploration manager in the Rocky Mountain region, has been named to succeed Fisher as assistant manager. The company's southern region has been divided into two regions, a southern region and a southwestern region with headquarters in Fort Worth. **H. H. Hinson,** assistant manager of the production department in Houston, will head the new southwestern region. **George W. Evans,** manager of transportation and purchasing at Houston, will be assistant region manager at Fort Worth.

S. G. Dolman has resigned as district supervisor for the California Division of Oil and Gas to become associated with the geological department of Honolulu Oil Corp. at Santa Barbara, Calif. With the division for 25 years, he had been stationed at Los Angeles, Santa Barbara, and Santa Maria.

James L. Cowell, formerly a senior geologist for Shell Oil Co. at Ventura, Calif., has been made stratigrapher in that division. Other recent promotions and transfers in the area's exploration department include: **E. M. Curry,** advanced from coastal seismologist to division geophysicist at Ventura; **J. D. Bloomingdale,** geologist, transferred from Midland, Tex., to Butte, Mont.; and **R. O. LaRue,** seismologist, transferred from Long Beach to Casper, Wyo.

H. Allen Kelley, consulting geologist and petroleum engineer, has joined Bankline Oil Co. of California as resident geologist at Casper, Wyo.

Joseph D. Harnett, general superintendent of transportation operations for Standard Oil Co. (Ohio), has been appointed assistant manager of the department. In other changes in the transportation department, **Charles E. Curry,** superintendent of the Grayville division, was named senior su-

PERSONALS

perintendent, and **Charles R. Elder,** assistant superintendent of the Southwest division, was made superintendent. **Frank Colegrove,** formerly vice president of Allied Oil Co., Inc., Cleveland, has been named to the new post of executive vice president.

H. B. Fuqua, chairman of the board and chief executive officer of Texas Pacific Coal & Oil Co., has been elected chairman of the board of the Fort Worth National Bank. He will continue to hold offices with Texas Pacific, but will have a desk in the bank and advise with the president and other officers on bank matters. Fuqua started his career in the oil business with Empire Gas & Fuel Co. in 1919. In 1922 he joined Gulf Production Co. as geologist and in 1944 was named assistant to the president in charge of production operations for the Houston division. He resigned from Gulf in 1949 to join Texas Pacific. He is a past president of the American Association of Petroleum Geologists.

Kenneth A. McDaniel, process superintendent at the Lima, Ohio, refinery of Standard Oil Co. (Ohio), has been promoted to general superintendent succeeding **Clyde O. Rowley,** who has retired.

Clark F. Barb, head of the petroleum-engineering department of the Colorado School of Mines, has been named chairman of the Colorado State Secondary Recovery Committee of the Interstate Oil Compact Commission.

Benjamin F. Jones has resigned as manager of the western division for American Republics Corp. and will open offices as an independent operator at San Angelo, Tex. He will be associated with **Kenneth Lyons,** who has also resigned from American Republics. Their resignations will be effective March 15, at which time they will open their offices in San Angelo.

A. P. Claudet, formerly general manager and executive vice president of Schlumberger Surenco and Schlumberger of Latin America, has joined Leslie Bowling, consulting geologist at New Orleans, as partner. The new firm will be known as Bowling & Claudet. Claudet, who has been associated with the Schlumberger group for more than 22 years, is a past president of the New Orleans Geological Society.

Elbert G. Fye, Jr., geologist and independent operator, has moved his offices from Denver to Arcadia, Calif.

Richard E. Grove, assistant reservoir engineer for Ohio Oil Co., has been transferred from McFadden, Wyo., to Casper, Wyo.

Ervin G. Kroker, superintendent of Kroker Drilling Co., has been transferred from Lebanon to Foster, Ore.

Charles Henry Dunn, engineer for Stanolind Oil & Gas Co., has been transferred from Thibodaux, La., to Great Bend, Kans.

Benjamin L. Anderson, geologist for Skelly Oil Co., has been transferred from Pampa, Tex., to Hobbs, N. M.

John L. McCray, reservoir engineer for Shell Oil Co., has been transferred from Kilgore to Corpus Christi, Tex., in the same capacity.

John E. Schalk, vice president of R. L. Manning Co., has been transferred from Fort Worth, Tex., to Denver.

C. Harrison Cooper has been named manager of explorations for an operating unit formed by F. Kirk Johnson and Brooks-Scanlon, Inc. Operations, including drilling of exploration and development wells, will be carried on in the Mid-Continent, West Texas and the Rocky Mountain areas. Cooper was formerly district manager of exploration in West Texas for British-American Oil Producing Co.

John W. Cox, engineer for Phillips Petroleum Co. at Odessa, Tex., has been transferred to Lovington, N. M., as mud engineer.

H. A. Lenert has been promoted to district geologist for Carter Oil Co. at Shreveport.

D. I. Inglish, junior petroleum engineer for Sun Oil Co., has been transferred from Silver to Premont, Tex., and promoted to foreman.

A. P. Frame, assistant deputy petroleum administrator in charge of domestic operations, will serve this month in the new post of associate deputy administrator prior to returning at the end of March to his regular job as vice president of Cities Service Co. in charge of manufacturing and research. He will be succeeded as assistant deputy by **C. E. Davis,** vice president in charge of refining for Shell Oil Co., who has been serving as director of the refining division of the Petroleum Administration for Defense. Davis, in turn, will be succeeded by **William W. Keeler,** Phillips Petroleum Co., vice president, who joined PAD last month as deputy director of the refining division.

CORROSION EXPERTS.—Practical ways of controlling pipe-line corrosion were outlined in a short course conducted last week by the Tulsa section of the National Association of Corrosion Engineers. Instructors and directors who conducted the course are shown here during the meeting. Left to right are O. E. Murrey, Midwestern Engine & Equipment Co.; Ernest J. Liggett, Johns-Manville Sales Corp.; Hugh A. Brady, Pipe Line Maintenance Corp.; F. M. Cloninger, Texas Pipe Line Co.; H. M. Hughes, Oklahoma Natural Gas Co.; W. E. Huddleston, Huddleston Engineering Co.; J. R. Cowles, Oklahoma Natural Gas Co.; and Sam E. Bosley, Owens-Corning Fiberglas Corp. An account of the meeting appears in this issue on page 147.

PERSONALS

A.A.P.G. OFFICERS.—These three men were named to head the Rocky Mountain section of the American Association of Petroleum Geologists at the section's second annual meeting in Salt Lake City, February 28-29. Left to right are Thomas C. Hiestand, Cities Service Oil Co., Casper, secretary-treasurer; Alex Clark, Federated Petroleums, Ltd., Casper, president; and Paul H. Umbach, consulting geologist, Albuquerque, N. M., vice president. For notes on the big area discussed at this meeting, see page 159. Abstracts of some of the papers presented may be found beginning on page 125.

J. E. Washam, drilling superintendent for Ruhl Drilling Co., Inc., has been transferred from Rockport, Tex., to the firm's field headquarters at Alice, Tex.

Joe W. Bates has been promoted to drilling superintendent of Field Drilling Co. at San Antonio, Tex. **Chris Johnson** and **Tom Dancer** have been made tool pushers.

John Q. Vardaman, field and section foreman for United Gas Pipe Line Co. in Carthage, Tex., has been transferred to Houston and promoted to field drilling and production superintendent.

Sam R. Coleman has been promoted to production superintendent of the Jackson, Miss., district for Union Producing Co. He has been with the company 18 years.

Frank C. Barnes, geologist formerly with the New Mexico Oil Conservation Commission, has opened an office in Santa Fe, N. M., with field offices in Aztec, N. M.

Parker A. Robertson has been named assistant division exploration adviser for Gulf Oil Corp. at Houston replacing **Elliott H. Powers,** who resigned to join Southern Production Co. as vice president in charge of exploration. Robertson will also continue in the capacity of division reserves adviser to the vice president. **W. A. Shellshear** has been appointed division gas engineer for the Houston division succeeding **W. H. Woods,** who resigned; **K. H. McLaughlin** will succeed Shellshear as superintendent of gas and gasoline in the Gulf Coast district.

Fred C. Neuhart, process engineer formerly with Phillips Petroleum Co. at Bartlesville, Okla., has joined Stone & Webster Engineering Corp. at Boston.

John R. Tuttle of Standard Oil Development Co.'s process division has been named assistant secretary of Esso Standard Oil Co.'s manufacturing technical committee, succeeding **Leo J. Blatz** who is returning to Standard's process division.

George D. Wright has resigned from Imperial Oil, Ltd., and joined Can-Tex Drilling Co., Ltd., as general superintendent and assistant manager.

J. R. Doles, vice president and general manager of Ajax Pipe Line Corp., Springfield, Mo., will retire April 1 after more than 42 years with the firm. He joined the company in 1909 as a laborer and in 1931 he was elected vice president and general manager.

P. E. Lehr, general production superintendent for Shell Oil Co., Los Angeles, temporarily is acting as superintendent of the Los Angeles basin division. He succeeds **J. N. Gregory** who recently was transferred from Long Beach to Midland, Tex., as area superintendent for Shell.

D. C. Pontius, formerly junior engineer in Shell Oil Co.'s Los Angeles area offices, has been transferred to Casper, Wyo., as a junior exploitation engineer.

W. G. Skelly, president of Skelly Oil Co., was the guest of honor at a dinner in Tulsa, March 4, given by the Tulsa chapter of the National Conference of Christians and Jews, of which Skelly is a national director. He was given a citation which read in part: "Imbued with the sound American virtues of industry, integrity, undaunted courage and generous service, he has led in the development of understanding, good will, and cooperation among men of all racial and religious groups." Among the 500 in attendance were a large number of Skelly's friends from the oil industry from all parts of the country.

DEATHS

Emory M. Skinner, 48, chief engineer and technical director of Socony-Vacuum Oil Co., Inc.'s, Augusta, Kans., refinery, died February 29. He had been with the firm 17 years.

R. J. McFarland, 73, owner of Algona Oil Co., died recently in Centralia, Ill.

Frank McDonnell, 66, vice president of Hughes Tool Co., died in Oxnard, Calif., March 1. He had been with the firm for nearly 30 years.

Alfred R. Yorston, 62, general manager and treasurer of Oil Operators, Inc., died March 2 at Compton, Calif.

Louis E. Fischer, chairman of the board of Kansas-Nebraska Natural Gas Co., died recently in Chicago.

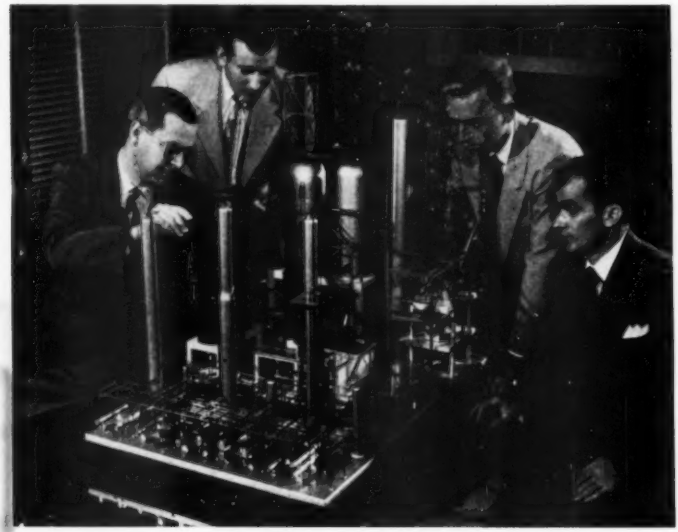
William Poling, 62, of Roosevelt Oil & Refining Corp., died recently in Mount Pleasant, Mich. For years Poling had been drilling superintendent for C. L. Maguire, Inc.

E. N. Baker, 63, independent leaseman, died recently at Big Rapids, Mich.

George W. Shaffer, 63, former president of Shaffer Specialty Co., Tulsa, died March 1 at Fort Collins, Colo.

Harry T. Vogel, 61, division manager of Signal Oil & Gas Co., died March 1 at Fort Worth, Tex.

Walter L. Cole, 60, division superintendent with Standard Oil Co. of California for 38 years, died recently in Los Angeles.



STUDY REPLICA OF CRACKER.—Robert R. Gumaer, technical assistant to the vice president, Pan-Am Southern Corp., points out details of the new catalytic cracking unit to engineering students. The model is accurately scaled to show the operating features of the unit, currently being constructed at the Destrehan, La., refinery.

Model Cracker

Replica of fluid catalytic cracking unit being built at Pan-Am Southern's Destrehan refinery aids training

A SCALE model of the fluid catalytic cracking unit being constructed at Pan-Am Southern Corp.'s Destrehan, La., refinery is being used as a means of instructing operators and plant engineers on its various operating features.

The model, small enough to be placed on a table top, has been constructed on a scale of ¼ in. to 1 ft. and contains all of the piping, pumps, heat exchangers, and other auxiliary equipment which comprise the unit.

The maze of piping used in the flow process is accurately positioned and scaled down to be an exact replica of the large unit. Detail has been completed to the inclusion of valves of varying sizes as part of the display.

Such items as ladder guards, manholes, and similar features are also part of the model in an effort to make it as authentic as possible.

The model, which is built on a base of 27¼ in. by 51½ in. and measures 37 in. to the top of the reactor stack, was built by Industrial Models, New York. Construction of the cracker is being done by Lummus Co., which is building a Standard Oil Development Co. Model IV fluid unit with a daily charge of 12,000 bbl. of gas oil.

Equipment.—Major pieces of equipment in the unit include the catalyst regenerator, the reactor, fractionator, absorber, debutanizer, and depentanizer splitter, plus two catalyst storage hoppers. The unit is being built on a ground area of 150 ft. by 225 ft. and its topmost elevation is 148 ft. above ground level at the top of the regenerator stack. Elevation of the fractionator is 115 ft. and that of the regenerator and reactor is 93 ft.

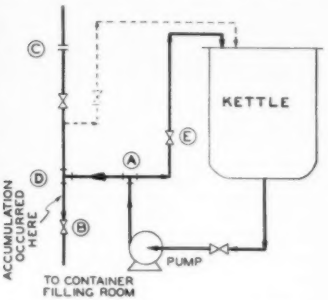
Concrete flooring is being used directly under the various units and auxiliary equipment. Shell is being used in the intermediate areas.

The cracker will use a silica aluminum 3A catalyst.

Three-Way Plug Smooths Grease-Plant Operation

Installation of a three-way plug and a pressure-relief line in the piping serving a grease kettle has eliminated possible contamination of the system's container filling line Sinclair Refining Co., Houston, reports.

Previously a tee connection *(see A in sketch)* had been used to carry the the circulated oil back into the kettle. This circulation of oil resulted in sulfur settling out above the gate



valve *(B)* used to control flow to drum-filling room. The sulfur was in such condition that upon settling it hardened to the point of rendering the line useless.

Whenever this occurred, it became necessary to unbolt the line flange *(C)* and "rod out" the line.

By installing a three-way plug valve in place of tee *(A)*, oil will flow only through the line to the drum filling room when the three-way valve is so positioned. At other times, when the oil is being circulated, the line to the drum-filling room will be completely blocked off.

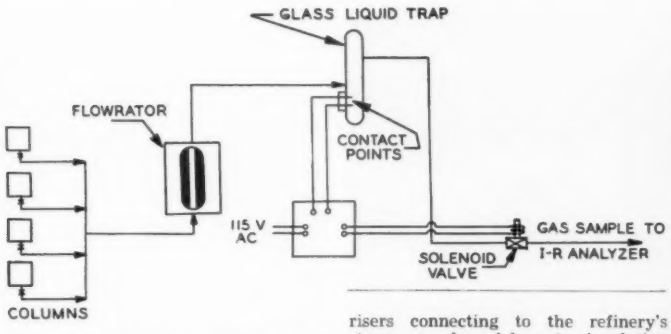
A 2-in. relief line installed above tee *(D)* regulates pressure to drum-filling room formerly controlled by valve *(E)* in circulating line.

Glass Trap Keeps Liquids From Reaching Gas Analyzer

A safety mechanism developed by Humble Oil & Refining Co. has eliminated the possibility of liquids reaching an infrared gas analyzer.

The system consists of a glass liquid trap through which gas is passed. (The analyzer measures isobutane content of normally gaseous streams at a light-ends fractionation unit.) Metal contact points connecting to an electronic switch are contained within the trap.

If liquid material heavier than normal butane enters the system because of an upset in the light-ends unit,



it will collect in the glass trap and operate the contact points. The electronic switch energized by the contact points will close a normally opened solenoid valve on sample line leading to the analyzer.

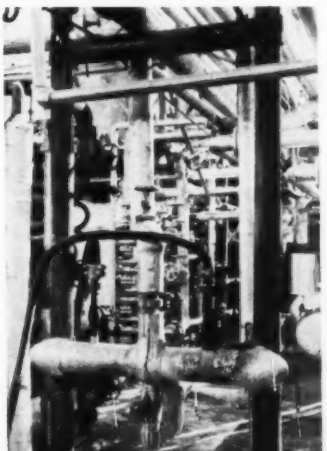
In this operation liquid material will be prevented from entering and causing possible injury to the infrared analyzer optical cell.

Multiple Use of Steam Hose Possible With Novel Headers

Steam is available instantly for fire fighting and other uses at New Mexico Asphalt & Refining Co.'s plant at Artesia, N. M., through use of special headers containing connections for several steam hoses.

The headers are the end of pipe risers connecting to the refinery's steam supply. Adequate insulation and traps to eliminate condensate are provided.

Short pipe nipples welded to the tops and sides of the headers are fitted with unions so that any hose can be attached quickly.



STEAM headers are equipped with trap and several fittings where hose can be attached in multiple at New Mexico Asphalt & Refining Co.'s Artesia plant.

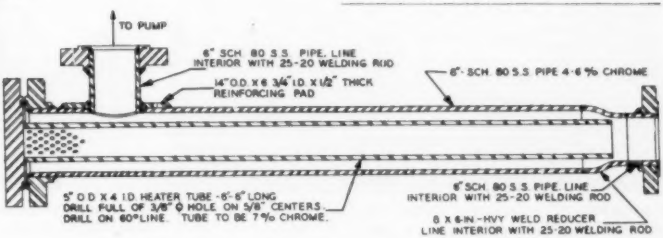
Strainer Eliminates Coke Carryover Trouble in Pump

Installation of a strainer made from a furnace tube has eliminated difficulty in operation of a pump due to carryover of coke particles at Phillips Oil Co.'s Okmulgee, Okla., refinery.

The pump was installed for handling thermal cracker recycle from the bottom of a thermal fractionator. Coking which was taking place in the reaction chamber was apparently carrying over to the thermal fractionator. From there, tarry residue or solid coke particles came into the pump suction and was plugging up the pump.

The condition became so serious that it was necessary to clean the suction line and the pump at least once a week.

A strainer was made from a 5-in. o.d. by 4-in. i.d. tube, drilled with a series of 3/8-in. holes on 5/8-in. centers and placed in the suction line (as indicated in drawing). The strainer requires cleaning only once every month or two. This is easily accomplished by simply disconnecting the flanged head and removing the strainer tube from the outer 8-in. pipe.


TO PUMP
6" SCH. 80 S.S. PIPE LINE INTERIOR WITH 25-20 WELDING ROD
14" O.D. X 6 3/4" I.D. X 1/2" THICK REINFORCING PAD
8" SCH. 80 S.S. PIPE 4-6 % CHROME
5" O.D. X 4 I.D. HEATER TUBE - 6'-6" LONG DRILL FULL OF 3/8" Ø HOLE ON 5/8" CENTERS. DRILL ON 60° LINE. TUBE TO BE 7% CHROME.
6" SCH. 80 S.S. PIPE LINE INTERIOR WITH 25-20 WELDING ROD
8 X 6-IN.-HVY WELD REDUCER LINE INTERIOR WITH 25-20 WELDING ROD

L. M. Coburn is maintenance superintendent at the Okmulgee plant.

GAGE POLE on float installed underground at Skelly's Armstrong plant to measure condensate drip.

Float Gage in Underground Tank Measures Condensate

A gage installed in an underground tank operating on an internal float effectively measures condensate drip from the main line at Skelly Oil Co.'s Armstrong plant at Pampa, Tex.

The float rests on top of the condensate, and is buoyant enough to support the gage rod and force it upward as the fluid accumulates.

Manhole cover of the tank was removed to attach a packing gland in the center, through which the indicator rod passes in its rise and fall due to level differences in accumulation and blowing down of the drips.

Backing up the rod is a piece of angle iron, which is attached to the manhole cover in a position so that the gage pole rides on the inside angle.

Marking off on the inside angle of the angle iron in feet and inches gives the operator a visual indication of the quantity of fluid contained in the drip tank. He can then tell easily when the tank needs to be blown down.

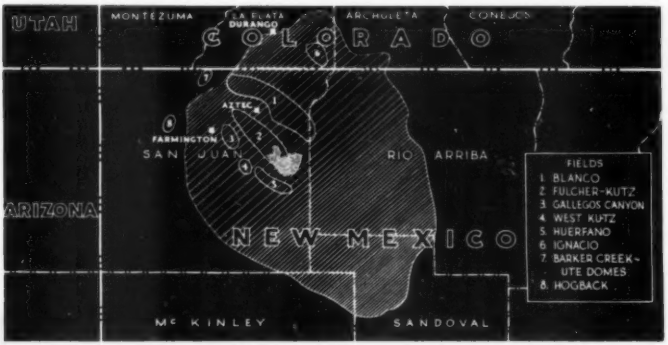


Photo-Tour of San Juan—Newest Major Gas Reserve

THE San Juan basin of northern New Mexico and southern Colorado is the nation's newest major gas reserve, and drilling is being carried on at a rapid pace.

But oil and gas are not new to the area.

Back in 1879 a prospector found oil seeps along the San Juan River near Mexican Hat, which touched off a search for oil that continued, off and on, for 40 years. Oil men found only a few small oil fields, however, and unknown quantities of gas.

Area revived.—A test drilled in old Kutz Canyon field near Farmington led a revived interest in 1945. Stanolind Oil & Gas Co., Tulsa, one of the main operators, entered the play in 1946. (Accompanying photos courtesy Stanolind.)

El Paso Natural Gas Co. has since constructed a 450-mile, 24-in. natural-gas line from the basin to southern

DRILLING RIG.—Stanolind Geolcgist Lee Graham and Engineer Hinkle check well's progress. Well was drilled with gas as circulating medium.

"TAILING IN."—About 100 drilling rigs are at work in San Juan. Completion rigs like this tailing-in unit keep busy in the seven gas fields.

BRIDGE.—Clay Wright, Stanolind pumper, on pipe-line suspension bridge from Hogback oil field. This pool was discovered in the 20's.

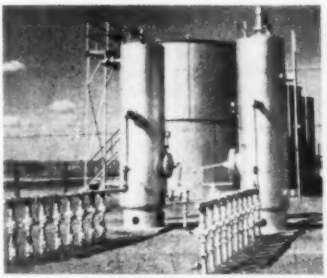
FARMINGTON, N. M., center for basin development, gained 2,000 new citizens in a year.

DURANGO, center of basin drilling and development in Colorado, is 50 miles from Farmington.

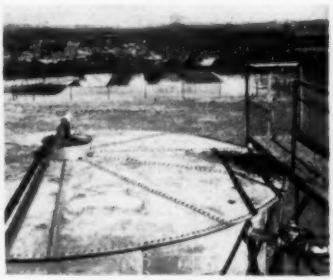
Californa to handle a big chunk of the major natural-gas supply which has resulted from the drilling program.

In 1950 the oil industry drilled 85 gas wells in San Juan, and last year had completed a total of 219. Already more than $25,000,000 has been spent in the basin, and work has just begun.

The "boom" has brought prosperity to the "four corners" area, (where Utah, Arizona, Colorado, and New Mexico join). The towns in the vicinity now have a new future—thanks to the petroleum industry. *(A detailed article on San Juan basin's fields, producing reservoirs and gas reserves appeared in The Oil and Gas Journal issue of August 2, 1951, page 62 et seq.)*



COMPLETED HOOKUP for producing wells. Entire installation is fenced. Testing and burning pit connected to separators and headers is approximately 100 yd. in the background.



CENTRAL PIT is an added convenience, leaves area around completed well free of sludge. Fenced enclosure of pit is a safety measure when burning fluids from drilling well.

Effective Gathering

Humble has neat way to handle oil from 131 wells

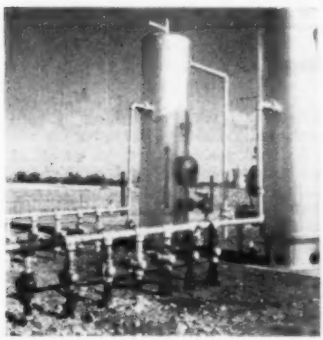
HUMBLE OIL & REFINING CO.'s production department has worked out a neat arrangement in handling oil from 131 wells on its Odom lease in Fort Chadbourne field, Runnels County, West Texas.

The setup of equipment as pictured is repeated throughout the field to conveniently service all producing wells.

Separators, 1,000-bbl. storage tanks, and a testing pit comprise each installation. Headers and connections for the separators are made up at the camp yard, in advance of the drilling program. When a well is ready to drill, gas for rig fuel is available from the lease gas system, and getting gas to the well site is a simple matter of connecting a 2-in. pipe line to the gas outlet at the separators and laying it above ground to the drilling rig.

Changeover.—When the well is finished, the same line is disconnected from the fuel supply lead to the rig engines and connected into the well head, and the flow reversed to the separator crude-oil headers.

All gathering lines on the lease are left above ground, except at road crossings, to take advantage of the prevailing higher temperature at the surface, over a buried line, which holds down paraffin coating of the pipe. One hookup, not shown, is an arrangement of three separators, one of which is used as a standby or for testing. The others are connected for two-stage production.



HOOKUP.—Seven headers in foreground, connected to 125-psi. working pressure separator on right, are connected below ground (No. 1 to No. 1, etc.) to the seven headers opposite, which tie into standby separator, left. Valve arrangement is such that any well may be produced, tested, or cleaned into central pit while any one well or all six remaining wells are produced through the other separator. Fuel gas lines from separator vent to drilling wells may be reversed, after well completion, and added to these headers.

Windlass for Raising Mud Guns Saves Time

One operator in eastern New Mexico saves considerable time by using a windlass on mud pits of its drilling rigs, to raise the mud guns. The windlass is installed so that one man can adjust the position of as many as three guns and mixing lines. It consists of a horizontal shaft made of pipe, carrying control chains so that the guns and lines attached to these chains can be positioned quickly. Bearings attached to both sides of the tank carry the horizontal pipe to retain it in operating position. Bearing and pipe rail of the tank on the operating side are perforated with matching holes to receive a pin to lock the adjustment in required position. Raising or lowering of the guns is done when operator grasps any of the spokes welded to the horizontal shaft where they may be reached while man is in a standing position.

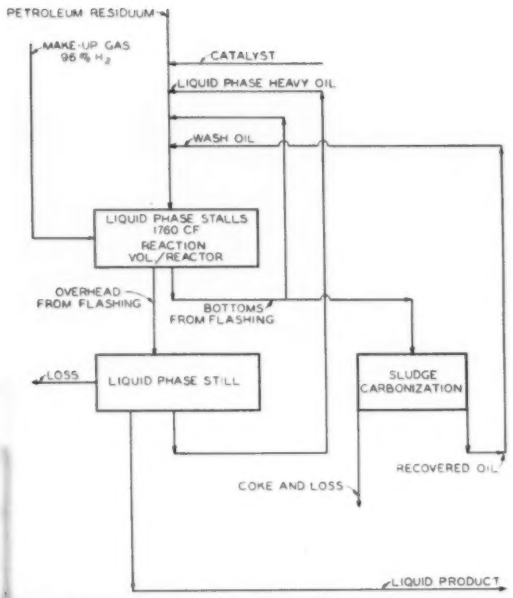


Fig. 1—Flow sheet for the liquid-phase hydrogenation of petroleum residuum. Plants were operated in Germany.

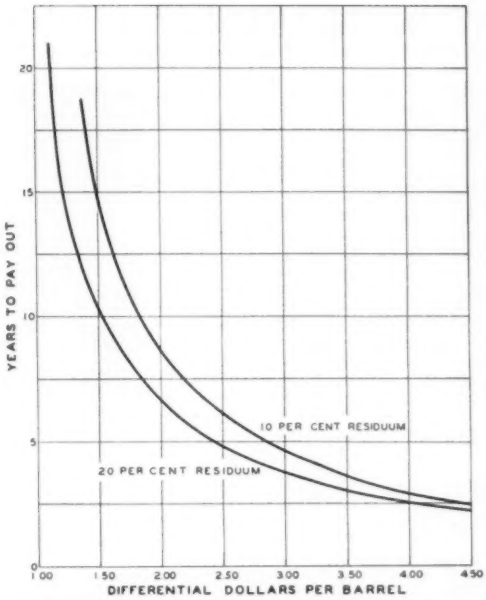


Fig. 2—Payout of hydrogenolysis investment versus the differential of crude oil and No. 6 fuel-oil prices.

Residuum Hydrogenolysis vs. Coal Hydrogenation

by Alfred Clark* and W. C. Lanning*

Synthetic fuels can be produced—at a cost.

What is the cost?

Apparently all in industry agree that substitute liquid fuels are more costly than those obtained from petroleum. The recent report of the National Petroleum Council synthetics committee on coal hydrogenation serves to emphasize this.

However, there are other ways of extending petroleum resources without imposing the much higher costs of substitute fuels on the public.

One possibility is the conversion of residual fuels to naphthas and distillates by hydrogenolysis (destructive hydrogenation).

Phillips Petroleum Co. reports pilot-plant results and preliminary economic studies for residuum hydrogenolysis.

HYDROGENOLYSIS of petroleum residuum has many economic advantages over synthetic fuels production:

1. The raw material is already being produced as a part of crude production.

2. The process dovetails admirably with present refining operations since the product of hydrogenolysis is well suited for further processing by conventional refining techniques.

3. Hydrogenolysis utilizes many of the techniques employed in the production of synthetic fuels, but represents a far less drastic transition. It could, therefore, serve as a gradual approach to the ultimate solution of the technical and economic problems involved in a prospective synthetic-fuels program.

Commercial plants.—Although the technical and patent literature contains many references to the upgrading of heavy residual petroleum stocks by hydrogenolysis, there has been little commercial application of the process to date. Two plants were operated in Germany during World War II, one at Stettin-Politz and another at Lutzkendorf.[1] These plants operated at a pressure of 700 atm. (10,500 psig.), a reaction temperature of about 900° F., and a space rate of approximately 0.6 volume of charge stock per volume of reaction space per hour, with a conversion of approximately 50 volume per cent of

*Research division of Phillips Petroleum Co., Bartlesville, Okla.

the charge per pass to below 600° F.

The catalyst, which consisted of finely divided active coke obtained from Brown coal in Winkler generators and impregnated with stoichiometric proportions of ferrous sulfate and caustic soda solution, was suspended in the charge oil. Catalyst makeup was approximately 1 per cent by weight of fresh oil charge. Subsequent operations for the production of motor fuel from the product of this operation were similar in every respect to the second stage or vapor-phase hydrogenation of "middle oil" from coal. Fig. 1 shows the flow sheet for the hydrogenolysis of petroleum residuum to middle oil. Yield data are presented in Table 1.

TABLE 1
Yield Data for Liquid Phase Hydrogenolysis of Heavy Petroleum Residuum at 700 Atm. Pressure
(Per cent of fresh oil charged)

	Weight per cent
Naphtha plus gas oil boiling below 600° F.	86
Hydrocarbon gas	12
Losses in purge	0.5
Hydrogen consumed	3.2

Pilot-plant work.—An experimental investigation of the hydrogenolysis of petroleum residuum conducted in Phillips Petroleum Co. laboratories has made use of three general catalytic process schemes:

1. High-pressure fixed-bed operation.
2. Low-pressure fixed-bed operation.
3. High-pressure suspended catalyst operation.

The high-pressure, fixed-bed operation utilizes a granular, pelleted, or extruded catalyst and operates continuously for long periods without regeneration at pressures of 3,000 psig. and higher. The low-pressure, fixed-bed operation is carried out similarly except that the pressure range is 500 to 1,000 psig. and short process cycles of 8 to 10 hours' duration are employed with regeneration of the catalyst to remove carbon deposits. A high-pressure, suspended catalyst operation has been described previously in connection with the German plants.

Choice of processing scheme.—This depends primarily on the type of feed stock. In general, suspended catalyst operation is the most versatile for it will handle the more degraded residuums, either cracked or virgin. In certain cases, however, the other two processing schemes may be more conveniently employed. Some virgin residuums of low asphalt content, for example, may be processed in fixed-bed operation without prohibitive carbon deposition. Certain high-sulfur, high-asphalt crudes appear to crack easily in the presence of hydrogen so that they also may be processed in fixed-bed operation. Data on the processing of cracked and virgin residuum and high-sulfur, heavy crude by the above three types of operation are given in Table 2.

Economics of Residuum Hydrogenolysis

Table 3 gives the estimated operating costs for a 2,750-bbl. per calendar day and a 5,500-bbl. per calendar

TABLE 3—MANUFACTURING COST OF RESIDUUM HYDROGENOLYSIS*
(5,000 psig.—operation on virgin residuum—10 per cent of total crude)

	Cost per barrel of total Liquid product (C_4-1,100° F.)	
	2,750 B.P.C.D.	5,500 B.P.C.D.
Direct operating cost:		
Labor and maintenance	$0.767	$0.716
Utilities	0.180	0.168
Supplies and chemicals	0.085	0.079
Indirect operating costs†	0.481	0.447
Total direct and indirect operating costs	$1.513	$1.410
Credit for fuel gas produced	0.013	0.013
Total net operating costs (ex. charge stock and amortization)	$1.500	$1.397
Amortization (15 year)	0.508	0.460
Interest on investment (4 per cent per annum)‡	0.164	0.152
Operating contingency	0.085	0.079
Total manufacturing cost (less charge stock)	$2.257	$2.088
Investment	$7,641,000	$13,868,000

*Early 1951 estimate. †Includes overhead, research, direct taxes, social security, insurance. ‡Includes interest on working capital.

TABLE 2—HYDROGENOLYSIS OF RESIDUUM

	Virgin residuum—Panhandle			Cracked residuum from topped crude			High sulfur, total crude—Montana		
Feed:									
Per cent of total crude		10							
A.P.I. gravity		18.5			15.3			19.9	
Boiling range		1,100 F.+			850 F.+			55% (vol.) above 850 F.	
Process scheme operating data:	H.P. fixed bed	L.P. fixed bed	Suspended catalyst	H.P. fixed bed	L.P. fixed bed	Suspended catalyst	H.P. fixed bed	L.P. fixed bed	Suspended catalyst
Temperature, °F.	875	875	875	875	875	875	850	850	875
Pressure, psig.	5,000	1,000	3,000	5,000	1,000	3,000	5,000	1,000	3,000
Space velocity, v/v/hr.	2	2	2	2	2	2	2	2	2
Cycle length, hr.		4-8			4-8			4-8	
H_2 flow, cu. ft. per bbl. of reactor charge	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Yield data:									
Converted per pass, vol. per cent	*67	*77	*79	†52	†44	†46	‡65	‡74	‡69
Hydrogen consumption, cu. ft. per bbl. of charge converted	1,000-1,200	350-400	600-700	1,500-2,000	1,000-1,200	1,000-1,200	1,000-1,500	800-1,000	800-1,000
Coke, wt. per cent of charge converted	<0.02	1.2	0.9	<0.1	3.3	3.4	<0.02	0.80	1.10
Ultimate yields (vol. per cent of fresh charge):									
C_1	1.20	1.30	2.10	6.20	5.20	5.10	3.80	2.50	4.10
C_4-400° F.	18.60	16.20	11.50	19.80	25.50	12.80	26.90	24.60	22.20
400°-600° F.	26.90	20.00	20.40	18.90	33.70	32.00	36.90	33.50	42.30
600°-850° F.	41.70	33.40	33.50	62.20	41.40	54.90	41.60	47.00	35.90
850°-1,100° F.	21.30	33.20	36.90						
C_4-1,100° F.	109.70	104.10	104.40						
C_4-850° F.				107.10	105.60	104.80	109.00	107.60	104.50
Product characteristics (A.P.I. gravity):									
C_4-400° F.	57.6	58.1	53.5	57.5	56.2	54.7	53.5	54.9	51.2
400°-600° F.	38.1	38.8	39.6	38.3	36.7	37.2	35.8	34.8	33.1
600°-850° F.	31.4	31.0	29.3	27.5	26.7	25.1	30.4	25.7	21.3
850°-1,100° F.	27.1	24.9	20.4						
Research O.N. (C_4-400° F. fraction):									
0 TEL	36.0	43.8	45.1	39.5	40.0	34.8	51.2	52.0	53.9
3 TEL	66.0	62.6	64.7	69.0	62.0	55.7	74.0	72.0	70.0

*Volume per cent of fresh charge which is converted to products boiling below 1,100° F. in one pass. †Volume per cent of fresh charge which is converted to products boiling below 850° F. in one pass. ‡Volume per cent of that portion of the fresh charge boiling above 850° F. which is converted to products boiling below 850° F. in one pass.

day unit charging a virgin residuum representing 10 per cent of the total crude and boiling above 1,100° F. These costs are based on a southwestern location. The complete investment for a 2,750-bbl. per calendar day plant is estimated at $7,641,000 and at $13,868,000 for a 5,500-bbl. per calendar day plant including hydrogen-production facilities.

Crude savings.—Using the cost figures of Table 3 for a 5,500-bbl. per calendar day plant, the effect of residuum hydrogenolysis considered economically as integrated with the refinery may be estimated. Table 4 shows that for the production of 100 bbl. of overhead stock from a crude containing 10 per cent residuum (1,100° F.+), 113.3 bbl. of crude are required without hydrogenolysis and only 99 bbl. with hydrogenolysis—a saving of 14.3 bbl. of crude per 100 bbl. of crude overhead stock produced. Corresponding figures are given for crudes containing 5, 15, and 20 per cent of a similar residuum. In these calculations, No. 6 residual fuel oil is assumed to be a blend of 85 per cent residuum (hydrogenolysis feed stock) and 15 per cent gas oil meeting the specification of 300 S.F. viscosity.

In Fig. 2, payouts have been estimated for various differences in price between crude oil and No. 6 residual fuel oil. Credits to hydrogenolysis include crude savings and decreased crude fractionation costs and debits include loss of fuel-oil sales and hydrogenolysis operating costs. No credit is taken for reduction in refinery corrosion, increase in lead response of motor fuel, and improvement in diesel fuel as a result of the desulfurization which takes place in residuum hydrogenolysis, or for the improved cracking stock which in many cases is obtained by hydrogenolysis in comparison with cuts of similar boiling range from the virgin crude.

The two curves in Fig. 2, one based on a crude containing 10 per cent residuum (hydrogenolysis feed) and the other 20 per cent, were calculated from the net incremental profits after taxes available for paying out the hydrogenolysis investment including working capital. For example, Fig. 2 shows a 10-year payout at a differential of $1.80 per barrel between the price of crude and No. 6 fuel oil in the case of a crude containing 10 per cent residuum or at a differential of $1.50 per barrel in the case of a crude containing 20 per cent residuum. Taking crude at $3.00 per barrel, the corresponding price for No. 6 fuel oil which would give a 10-year payout for hydrogenolysis are $1.20 and $1.50 per barrel, respectively.

Crude replacement savings.—It is interesting to speculate on the savings in investment for crude replacement which hydrogenolysis of residuum makes possible. From Table 4 it can be calculated for the case of a crude containing 10 per cent residuum (1,100° F.+) that for every barrel of residuum processed by hydrogenolysis, crude requirements are reduced by 1.44 bbl. for a given overhead stock production. A hydrogenolysis unit charging 5,000 bbl. per calendar day of residuum would cost $13,868,000 and would reduce crude requirements by 7,200 bbl. per calendar day. The cost of saving a daily barrel of crude is calculated to be $1,925. (This is considerably less than figures usually quoted—between $2,500 and $5,000—for the cost of replacing a barrel of crude.) Corresponding costs of saving crude containing 5, 15, and 20 per cent residuum are found to be $2,020, $1,800 and $1,660 per daily barrel, respectively.

Instead of operating a refinery on a given production of overhead stocks and taking a saving in crude requirements by employing hydrogenolysis of residuum, the crude charge may be held constant and hydrogenolysis employed to give an increase in overhead stocks—gasoline and distillates—at the expense of fuel oil. Table 5 shows that in such an operation on a virgin residuum representing 10 per cent of the total crude, 12.7 additional barrels of overhead stock per 100 barrels of crude are produced.

Residuum Hydrogenolysis vs. Coal Hydrogenation

It is obvious to anyone familiar with synthetic fuels investments that they are considerably greater than those given above for hydrogenolysis of petroleum residuum. A 30,000-bbl. per day coal-hydrogenation plant including mining facilities, for example, has been estimated to cost $450,000,000.[3] If this investment were used to construct a conventional 30,000-bbl. per day petroleum refinery and the remainder of the money used to build units for hydrogenolysis of pe-

(Continued on page 120)

TABLE 4—CRUDE SAVINGS BY HYDROGENOLYSIS OF VIRGIN RESIDUUM
(5,000-psig. operation)

	Without hydrogenolysis				With hydrogenolysis			
1,100° F.+ bottoms in crude, per cent	5	10	15	20	5	10	15	20
Production of overhead stocks, C_5-1,100° F., bbl.	100	100	100	100	100	100	100	100
Crude required, bbl.	106.2	113.3	121.3	130.7	99.5	99.0	98.5	98.0
No. 6 fuel-oil production*	6.2	13.3	21.3	30.7	0	0	0	0

*Composition for 300 vis.: Crude bottoms, 85 per cent; gas oil, 15 per cent.

TABLE 5—INCREASED PRODUCTION OF OVERHEAD STOCKS BY HYDROGENOLYSIS OF VIRGIN RESIDUUM*
(5,000-psig. operation)

	Without hydrogenolysis	With hydrogenolysis
Crude supply, bbl.	100	100
Production of overhead stocks (C_5-1,100° F.)	88.3	101
No. 6 residual fuel-oil production†	11.7	0

*10 per cent crude bottoms, 1,100° F.+ †Composition for 300 vis.: 10 per cent crude bottoms, 85 per cent; gas oil, 15 per cent.

TABLE 6—RESIDUUM HYDROGENOLYSIS VS. COAL HYDROGENATION

	Hydrogenolysis of 10 per cent residuum		
	Hydrogenation of coal	Substituting eastern coal for No. 6 fuel oil	Substituting western coal for No. 6 fuel oil
Coal consumed, tons per day	13,000	34,500	38,750
Increased liquid fuels supply, bbl. per day	30,000	30,000	30,000
Decreased crude requirements, bbl. per day	0	138,500	161,000

TABLE 7—INCREASED SUPPLY OF NAPHTHA AND DISTILLATES BY HYDROGENOLYSIS OF 1951 ESTIMATED CONSUMPTION OF RESIDUAL FUEL OIL

Use—	Amount Res. F.O. bbl./day consumed	Fuel substituted for Res. F.O.	Amount coal or gas substitute required: Coal (T./D.)	Gas (M.M. C.F./D.)	Amount hydro substitute bbl./day required	Amount hydro bbl./day product produced	Excess hydro bbl./day supply
Commercial heating	184,700	Coal or gas	46,175	1,041	0	203,170	203,170
Railroads	163,800	Diesel fuel*	0	0	81,900	180,180	98,280
Public utilities	243,800	Coal or gas	60,950	1,372	0	268,180	268,180
Industry	546,600	Coal or gas	136,650	3,085	0	601,260	601,260
Marine	266,300	Diesel fuel*	0	0	130,150	286,330	156,180
Miscellaneous	100,300	Distillates*	0	0	50,150	110,330	60,180
Total	1,499,500		243,775	5,498	262,200	1,649,450	1,387,250

*Efficiency of diesel fuel is conservatively estimated as twice that of residual fuel oil-fired steam engines.

better guide to more oil?

LOOK TO

Dowell Electric Pilot

FOR SERVICE EXTRAS

Housed in the Dowell Electric Pilot control truck are modern scientific devices designed to help the oil production engineer. From the Electric Pilot comes a variety of services—to aid in obtaining subsurface data on well conditions, and to help in planning and expediting more successful completion and workover programs.

And on each Pilot job is a Dowell Engineer . . . trained in the use of this modern electronic equipment . . . experienced in helping correlate Electric Pilot data into successful well programs.

The Dowell Electric Pilot was developed to help you. Results from thousands of jobs in many fields have proved its worth. There's a Dowell office near you to provide Electric Pilot Service at your convenience.

How can the Electric Pilot help you?

SELECTIVE ACIDIZING—Pilot is used to direct acid into selected zones to get best treatment results. As many as *three separate* zones can be acidized selectively in *one* operation. Also used to protect casing seat during acidizing.

PERMEABILITY SURVEYS—Pilot is used to show location of permeable zones and their capacity to take fluid in relation to other zones, especially as a guide to selective acidizing. Also used to locate leaks around casing shoes, leaks in cement plugs and holes in casing.

SPINNER SURVEYS—Pilot is used to measure relative capacity or production of zones exposed in producing or input wells—as a guide in selective acidizing, for example. Also used to locate zones of lost circulation, casing leaks and circulated shoes.

WATER LOCATION—Pilot is used to locate points of water intrusion into wells, a prerequisite to successful completion and workover programs. The latest water location method uses photoelectric cell.

PERFO-JET—Pilot is used to control casing perforating and open hole shooting with Perfo-Jet's shaped charges. Dowell Perfo-Jet guns are available in a wide variety of sizes and types including the famous Glass Gun.

CALIPER SURVEYS—Pilot is used to give information on well bore diameters and irregularities. Caliper automatically records diameters as large as three feet and shows variations as small as pipe collars —a fractional part of an inch!

DOWELL SERVICE

Acidizing • Electric Pilot • Plastic • Perfo-Jet • Chemical Cleaning for heat exchange equipment • Jelflake • Paraffin Solvents • Bulk Inhibited Acid

DOWELL INCORPORATED • TULSA 1, OKLAHOMA

A Subsidiary of The Dow Chemical Company

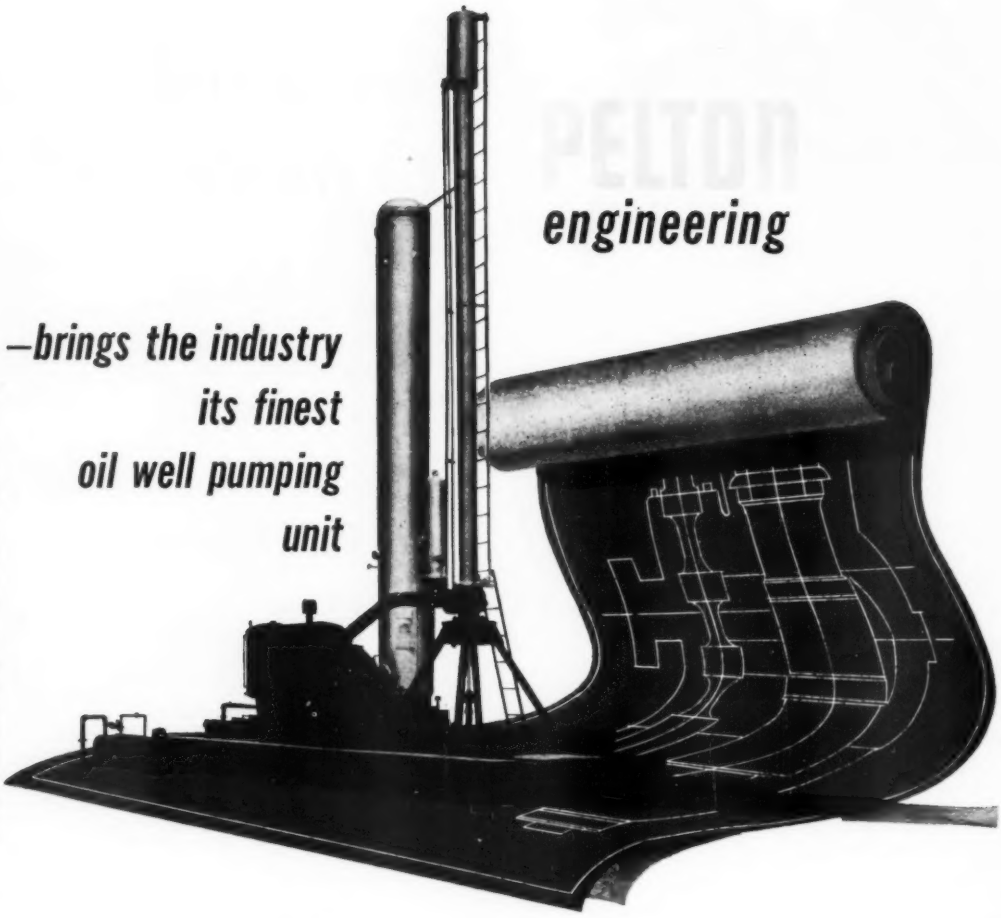
"First in Oilfield Acidizing . . . Since 1932"

Look to **DOWELL**

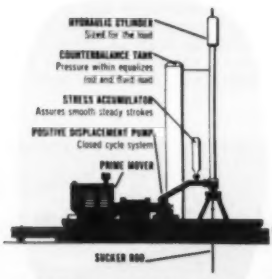
FOR OIL INDUSTRY CHEMICAL SERVICE

engineering

—brings the industry its finest oil well pumping unit



The PELTON Long Stroke Hydraulic Pumping Jack



This outstanding heavy duty pumping unit with stroke lengths up to 30 ft. and polished rod loads up to 40,000 pounds produces more oil per day than any pumping means known.

Getting down to cases, a Pelton 30 ft. unit is pumping 925 B D with a 2-1 4" bore pump set at 8100 ft. Previously, this same well, using a 108 in. Beam Pumper, produced only 400 B D.

Another case, a 30 ft. unit (on the world's deepest rod pumped well) is pumping 300 B D with a 1-1/2" pump set at 11,700 ft.

On shallow wells, too, where potential is high, production is being increased 100% and more, over previous pumping equipment.

Here's another point — long slow strokes with soft reversals reduce peak stresses in the rod string resulting in 80 to 90% decrease in rod partings. With less wear on the bottom hole pump, well servicing is commonly reduced 70%.

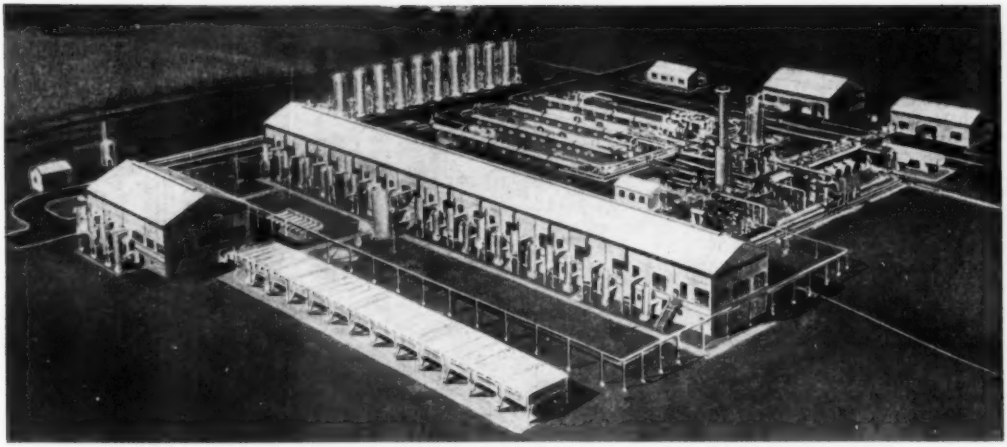
And what is the cost of Pelton equipment? You will be surprised to learn that the Pelton 10 ft. model "D" Jack, for example, costs considerably less than a comparable Beam Unit. Pelton Jacks are available in 10, 20 and 30 ft. stroke lengths.

For outstanding improvement in oil well production, **LOOK TO PELTON — ENGINEERS IN HYDRAULICS FOR OVER 70 YEARS.**

THE PELTON WATER WHEEL COMPANY
OIL INDUSTRY MACHINERY DIVISION
2447 EAST 54th STREET, LOS ANGELES 58, CALIFORNIA

Subsidiary of Baldwin-Lima-Hamilton Corp.

LOS ANGELES • SAN FRANCISCO • AVENAL • DALLAS • HOUSTON • ODESSA • NEW YORK CITY • PHILADELPHIA



Plant layout for Tennessee Gas Transmission's Gabe, Ky., hydrocarbon-extraction plant.

Hydrocarbon Extraction by Refrigeration

Tennessee Gas Transmission Corp. operating new plant handling 750,000,000 cu. ft. daily

by J. J. King* and R. V. Mertz†

Here is a very interesting development in natural-gas pipe-lining practice—large-scale dehydration and hydrocarbon extraction at special plant located on company's main-line system.

High points of the new Tennessee gas installation are:

1. LARGEST CAPACITY.—The 750,000 M.c.f. daily design capacity is largest ever incorporated for a plant processing natural gas.

2. REFRIGERATED, AND COLD.—Entire process gas stream chilled to —96° F. Certain temperatures reach —121° F.

3. BETTER PIPE LINING.—The extraction plant removes 380,000 gal. daily of heavier hydrocarbons. Result is that pipe line thereafter transports mainly methane.

4. PLANT PROCESS has two major operations.—(1) Extraction of all ethane and heavier hydrocarbons from input gas, and (2) division of raw liquid product, with methane plus controlled percentage ethane back to pipe line.

5. COMPRESSION.—Gas-driven compressors important part of plant facilities; thirteen 1,760-hp. units for process and refrigerant operations.

6. LIQUID PRODUCTS.—These move by 60-mile, 8-in. pipe line to chemical company for processing to propane, L.P.G., natural gasoline and other products.

THE largest gas capacity ever designed for a plant processing natural gas is incorporated in a plant recently completed and put into operation by Tennessee Gas Transmission Co. near Greensburg, Ky. The plant receives natural gas from the company's pipe line, removes ethane and heavier hydrocarbons, and returns the stripped gas to the pipe line. The design capacity of the plant is 750,000 M.c.f. per day. Separation of the ethane and heavier hydrocarbons from the gas stream is accomplished by using refrigeration only. Refrigeration capacity required is equivalent to a 12,000-ton per day ice-making plant.

Under normal operating conditions the entire gas stream through the plant will be chilled to minus 96° F. Liquids previously found to be objectionable to Tennessee's gas customers will be condensed and delivered to a chemical company which will convert them to L.P.G., natural gasoline, and ethane. Total liquid production will eventually amount to 380,000 gal. per day when the operation has been stabilized and the design quantity of gas is processed.

A unique heat-exchanger arrangement is used in order to accommodate the large volume of gas processed. The gas stream from the pipe line is split into four parallel streams through the plant. Heat exchangers 42 in. in diameter are assembled end to end to form the four heat-exchanger trains. The long exchanger-train arrangement was chosen to simplify the piping and to provide a straight-through path for the gas. This arrangement makes for low pressure drop in addition to the simplified piping arrangement.

Construction of the plant was started in May 1950. The site near Greensburg was chosen because of the convenience to Tennessee's main transmission line and the chemical plant which will process the extracted liquid stream. Tennessee's extraction plant is connected with the chemical plant by a 60-mile-long, 8-in. pipe line.

Plant Processing

The process utilized to recover the hydrocarbons from the pipe line gas consists basically of only two major

*Vice president and †compressor superintendent, Tennessee Gas Transmission Co., Houston.

operations. The first operation is the separation of the desired hydrocarbons from the feed-gas stream. This is accomplished by cooling the gas stream until a sufficient quantity of the hydrocarbons condenses. The second operation involves processing the condensed hydrocarbon liquid to remove unwanted methane and to control the amount of ethane present in the product stream. This is accomplished by flashing the hydrocarbon liquid twice at successively lower pressures and then fractionating it.

Dehydration.—Gas entering the plant from the pipe line must be dried before being subjected to low-temperature processing. Eight dehydrators operating on stream in parallel are required to handle the total feed-gas flow. A flow controller is provided on the inlet piping to each dehydrator to distribute the flow evenly among dehydrators and to control the total plant throughput.

Ten dehydrators are provided in order to have eight effective units on stream at all times. Each dehydrator contains a 20-ft.-deep bed of alumina granules through which the wet gas passes during the drying cycle. Water absorbed during this cycle is removed by taking each dehydrator off stream periodically and passing hot gas through the alumina bed. The reactivated dehydrator is then cooled by passing a cool gas stream through the bed and is ready for return to service. The 10 dehydrators have been designed to permit a continuous operating schedule with eight units always in on-stream condition while the other two are being reactivated and cooled.

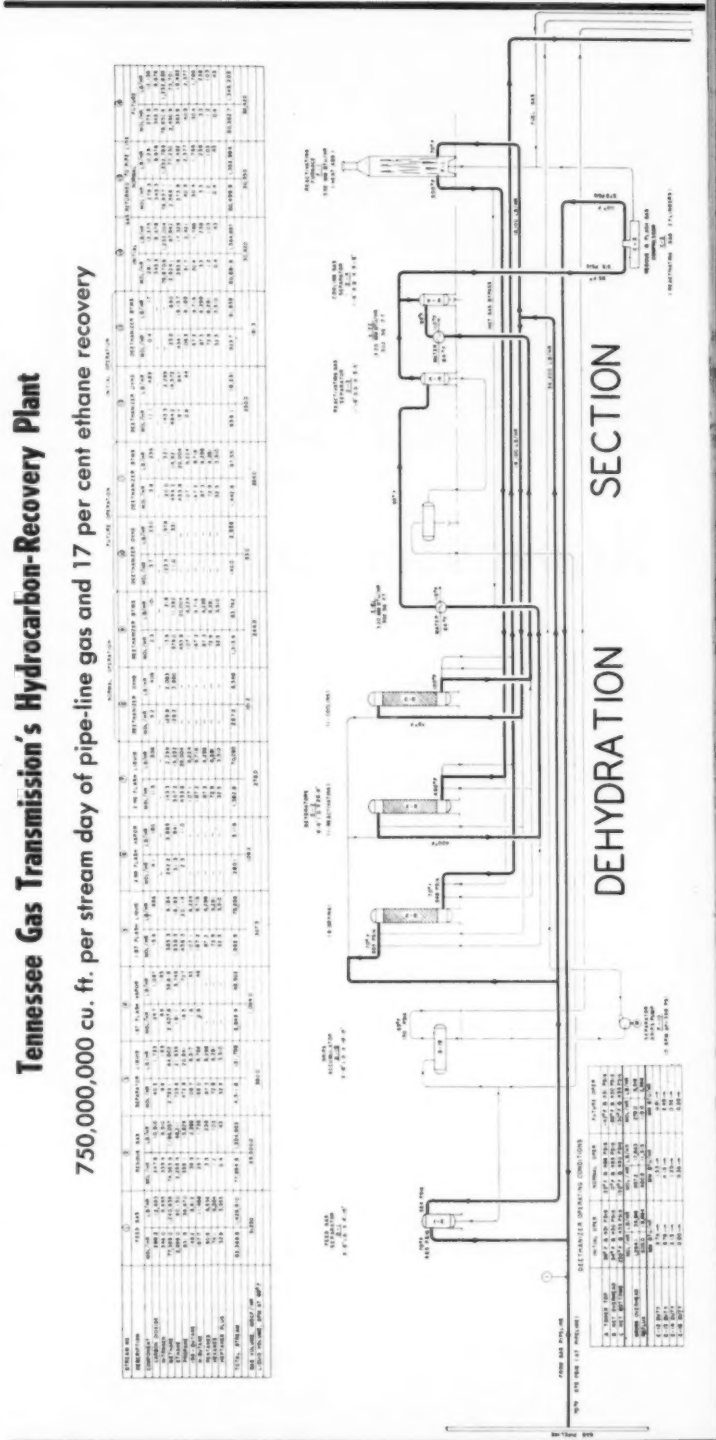
Dry gas from the dehydrators at 70° F. is cooled to —104° F. at approximately 535 psig. Under these conditions about 5.5 mol per cent of the gas condenses. The condensed hydrocarbon liquid is separated and the residual gas, after heat exchange, is compressed to 590 psig. and returned to the pipe line.

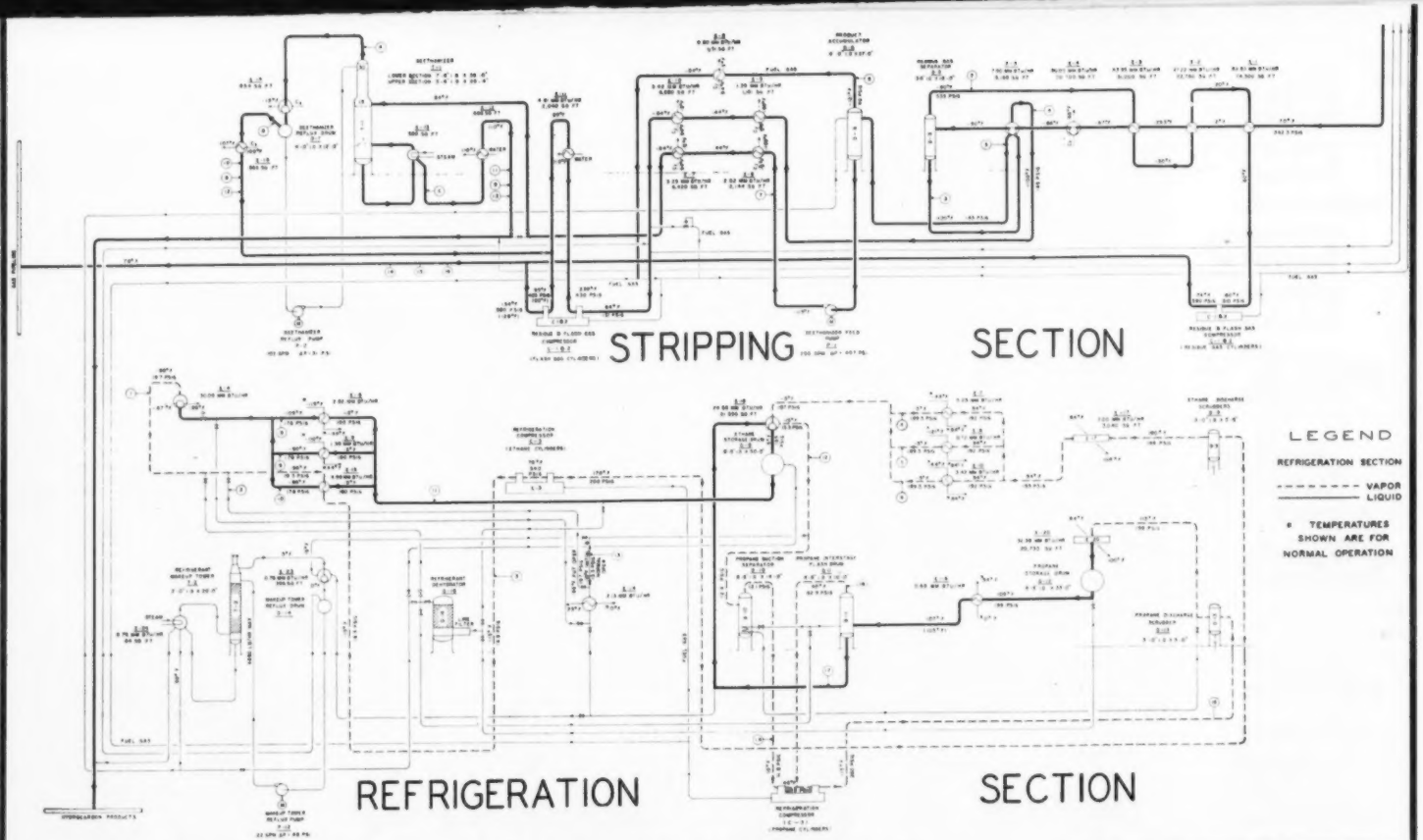
Heat exchange.—Four parallel trains of heat exchangers are required for feed-gas cooling when the plant is operating at design capacity. Dehydrator exit piping is manifolded in such a way that each exchanger train receives gas from one pair of on-stream dehydrators. Thus, the gas flow through each train is controlled by the setting of the flow controllers upstream of the dehydrators.

In each train these exchangers are bolted end to end, providing straight-through flow for the feed gas on the tube side. The first four shells exchange heat between the incoming warm feed gas and the cold residue gas stream from which the condensed hydrocarbon liquid has been removed. Thus, these exchangers serve the dual purpose of cooling the feed and recovering refrigeration from the residue gas. The fifth shell in each train employs ethane refrigerant at —96° F. to furnish the net refrigerat-

Tennessee Gas Transmission's Hydrocarbon-Recovery Plant

750,000,000 cu. ft. per stream day of pipe-line gas and 17 per cent ethane recovery



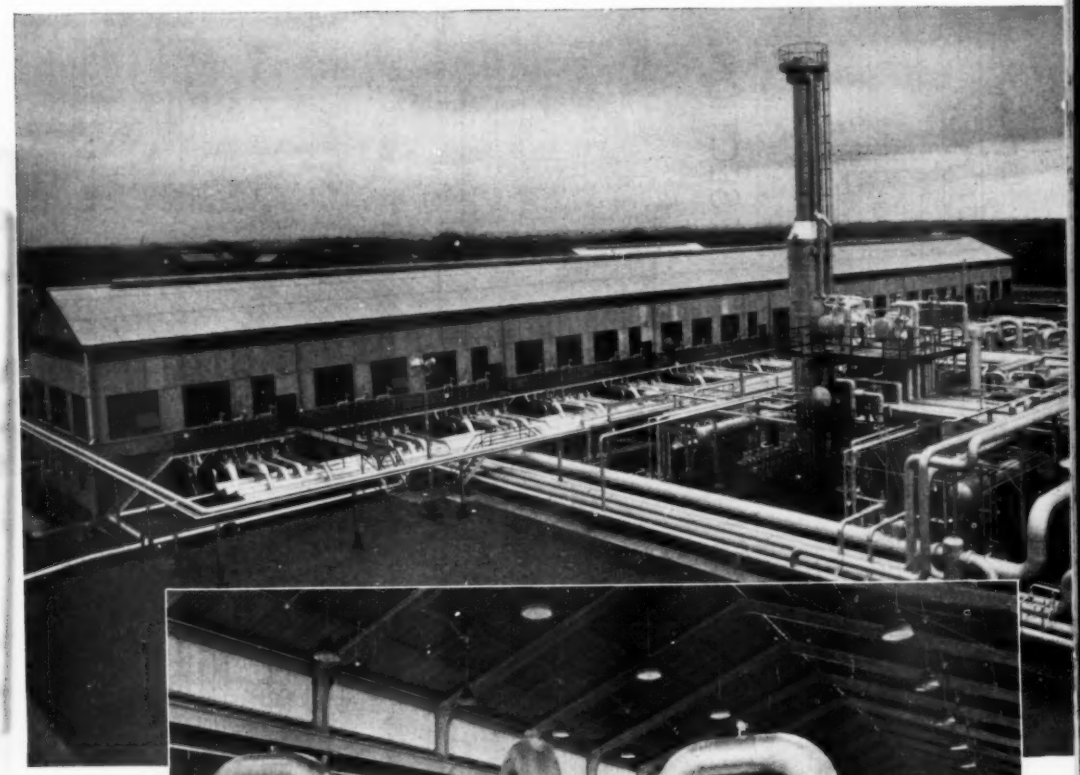


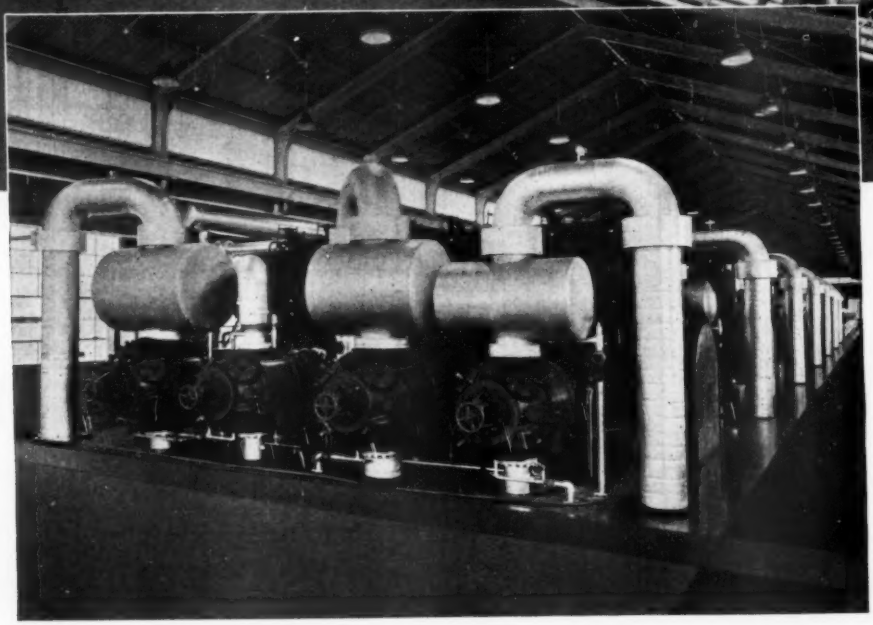
	①	②	③	④	⑤	⑥
INITIAL OPERATION						
LBS/HR	160,010		160,010	91,650	9,360	58,800
SCFM	33,630		33,630	19,280	2,010	12,340
GPM AT 60°F	–		–	–	–	–
NORMAL OPERATION						
LBS/HR	160,010		160,010	91,650	9,360	58,800
SCFM	33,630		33,630	19,280	2,010	12,340
GPM AT 60°F	–		–	–	–	–
FUTURE OPERATION						
LBS/HR	160,010	2,540	162,550	92,950	9,800	59,800
SCFM	33,630	535	34,165	19,535	2,060	12,570
GPM AT 60°F	–	–	–	–	–	–

	⑦	⑧	⑨	⑩	⑪	⑫
INITIAL OPERATION						
LBS/HR	–	42,240	25,240	92,530	160,010	165,750
SCFM	–	–	–	–	–	23,750
GPM AT 60°F	–	228	135	496	860	–
NORMAL OPERATION						
LBS/HR		42,240	25,240	92,530	160,010	165,450
SCFM		–	–	–	–	23,678
GPM AT 60°F		226	135	496	857	–
FUTURE OPERATION						
LBS/HR		42,990	25,700	93,660	162,550	169,800
SCFM		–	–	–	–	24,250
GPM AT 60°F		230	138	503	871	–

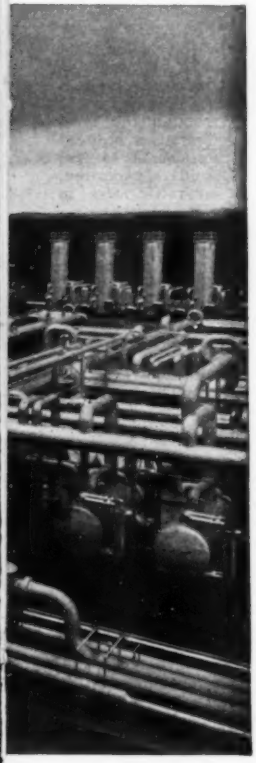
	⑬	⑭	⑮	⑯	⑰
INITIAL OPERATION					
LBS/HR	14,750	160,500	239,900	59,400	180,500
SCFM	2,110	25,650	34,350	8,500	–
GPM AT 60°F	–	–	–	–	708
NORMAL OPERATION					
LBS/HR	8,650	174,100	232,960	58,660	174,100
SCFM	1,240	24,910	33,320	8,410	–
GPM AT 60°F	–	–	–	–	681
FUTURE OPERATIONS					
LBS/HR		169,800	227,900	58,100	169,800
SCFM		24,280	32,560	8,310	–
GPM AT 60°F		–	–	–	664

Clark "Big Angles"





score another first!



Clark HBA Compressors, Famed for Sustained Fuel Economy and Dependability, Installed in World's Largest Ethane Recovery Plant

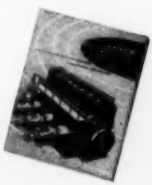
Tennessee Gas Transmission Company recently placed in service the largest ethane recovery plant ever built for operation in conjunction with a gas transmission pipeline. In designing the Gabe, Kentucky plant, process requirements dictated the following rigid compressor specifications:

- A total of 23,000 horsepower required
- 1600 to 1800 horsepower units were necessary for proper compressor distribution between the five compression services
- 750,000,000 cubic feet per day capacity
- Four compressor cylinders per unit
- Minimum fuel consumption was necessary because overall economics indicated an "end of the line" high fuel cost, plant location

With over 135,000 horsepower of Clark BA and HBA compressors already operating in their other compressor stations or on order, Tennessee Gas Transmission Co. knew first hand what the "Big Angle" could do. Thirteen Clark 1760 BHP, High Compression "Big Angles" were subsequently installed to handle all compression services in the new plant. These services include propane refrigeration, ethane refrigeration, reactivating gas service, flash gas service and the return of residue gas to the pipeline.

If you are contemplating building a plant involving intricate processing operations, consult your nearest Clark representative. He has the compressor know-how and a complete line of heavy duty compressor equipment to simplify your installation.

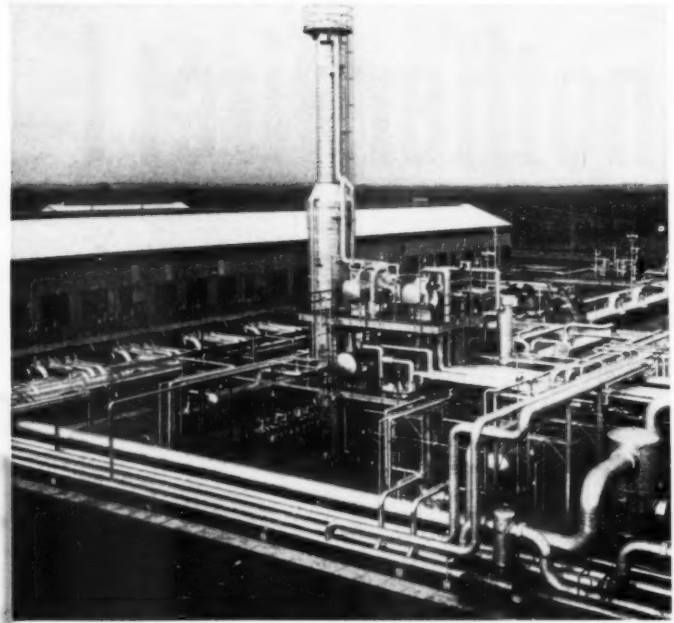
For complete details on Clark Big Angles request Bulletin 104



CLARK BROS. CO., INC. • OLEAN, N. Y.
One of the Dresser Industries
OFFICES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

There's a BIG difference in...

CLARK compressors



Refrigeration area of plant, with deethanizer tower in center and compressor building in background.

ing effect required to remove latent heat from the liquid product. The last shell in line recovers refrigeration by evaporating excess light hydrocarbons, principally methane, which were condensed in the high-pressure separator.

Flash operations. — The hydrocarbon liquid connected in the liquid separator is flashed to a lower pressure. In passing through the expansion valve, a portion of the liquid is vaporized and the stream is cooled by self-refrigeration. The vapor-liquid stream is warmed by heat exchange with the feed, the liquid is separated and flows to the second feed flash operation, while the disengaged vapor, after further heat exchange, is compressed and returned to the pipe line.

This series of operations, constituting the first feed flash, is designed to reduce the methane content of the hydrocarbon liquid condensed from the feed gas. The liquid is flashed and heated under conditions which are favorable to the preferential vaporization of methane and which also make possible the recovery of valuable low-temperature refrigeration.

Liquid from the first flash exchanger is flashed to a lower pressure. The residual liquid from the flash is separated from the vapor and is forwarded to the fractionator while the vapor, after heat exchange, is used for plant fuel. While the first flash operation removed a substantial amount of methane from the liquid stream, a further reduction in methane content is necessary.

In the second flash, a methane-rich vapor is removed, leaving a liquid of less than half the original methane content. In principle, the second flash operation is quite similar to the first, but differs in that the addition of heat is not required to secure the desired degree of vaporization.

In the second flash operation, first flash liquid at —112° F. and 145 psig. flows into a common product accumulator which is operated at 40 psig. In passing through the level control valve the pressure is reduced from 145 to 40 psig., about 15 mol per cent of the liquid is vaporized, and the stream self-refrigerates to —121° F.

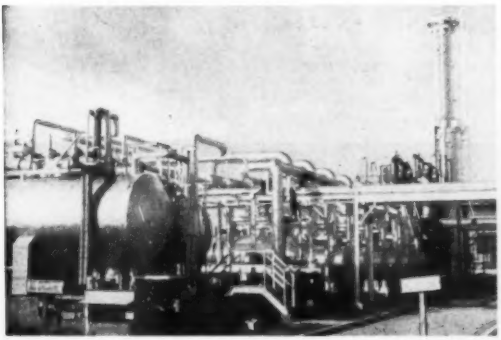
The —121° F. vapor-liquid mixture is separated in a product accumulator. The liquid is then pumped to the deethanizer, while the —121° F. vapor is warmed to 84° F. by heat exchange with an ethane refrigerant stream and then flows into the plant fuel system.

Liquid from the product accumulator is pumped through heat exchanges to the deethanizer. The tower produces a bottoms liquid product of desired specifications which is cooled and then flows from the plant to the product line. Tower overhead vapor, after heat exchange, is compressed for return to the gas pipe line.

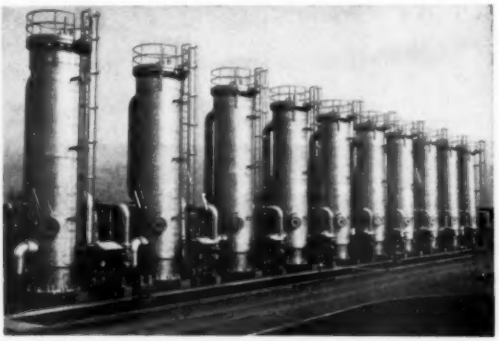
Process Gas Compression

The residue-gas stream, the first flash vapor stream, and the deethanizer overhead must be compressed for return to the pipe line. In addition the dehydrator reactivating and cooling gas requires recompressing in order to get it back into the feed gas to the plant. Six 1,760-hp. gas-engine-driven reciprocating compressors are used for process-gas com-

(Continued on page 116)



Refrigerant storage and heat exchangers, with demethanizer in background.



Battery of dehydration towers which reduce dew point of main gas stream to —100° F.

Minutes pay off for years!

In a few minutes you can see for yourself what International Trucks have that no other trucks can give you.

You need only visit an International Truck Dealer or Branch. There you'll get the facts on the lower operating and maintenance costs, and longer truck life you get from the International Truck engineered for your job.

A few minutes will pay off in years of better truck performance. So stop in soon.

INTERNATIONAL HARVESTER COMPANY · CHICAGO

Check these exclusive advantages of Internationals:

- All-truck engines—exclusively for truck work—built in the world's largest truck engine plant.
- The "roomiest, most comfortable cab on the road"—the Comfo-Vision Cab designed by drivers for drivers.
- Super-steering system—more positive control, easier handling and 37° turning angle.
- Traditional truck toughness that has kept International first in heavy-duty truck sales for 20 straight years.
- 115 basic models . . . everything from ½-ton pickups to 90,000 lbs. GVW off-highway models.
- America's largest exclusive truck service organization.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

INTERNATIONAL TRUCKS

More than One Million Now on the Road

Model LF-190, 157 inch wheelbase, 30,000 lbs. GVW.

OIL-BASE DRILLING FLUIDS . . .

. . how they differ
. . advantages of certain types
. . actual well-completion results

GEO. MILLER
President, Oil Base, Inc., Compton, Calif.

by Geo. Miller

A GOOD oil-base drilling fluid is a synthetic mud which has most all the properties, and some qualities not possessed by water-base mud plus the added advantages of not allowing the producing formation to become water blocked or mudded off. Use of oil-base mud is highly important to obtaining accurate core analysis and computation of reservoir information.

Results obtained during the past 10 years show that usage of desirable oil-base muds in some cases is the difference between a dry hole and a substantial producer. The majority of cases prove that use of a good oil-base drilling fluid in drilling the pay zone results in a higher initial well production and over a period of years the production comparison is even more amazing—sometimes amounting to a net difference to the well owner of several hundred thousand dollars per well.

For the ideal type of oil-base mud, the following properties are necessary:

1. Completely flexible in properties throughout the weight range, (gel strength-weight material suspending ability) viscosity range, and for all practical ranges of temperature encountered.

2. As nearly perfect plastering properties as possible.

3. As nearly perfect deplastering properties as possible which will allow the return permeability of the producing formation to be at least 96 per cent of its original value.

4. Lose no water to the producing formation.

5. The removal of accumulated water from drilling operations, atmospheric conditions, or inadvertent additions must be able to be economically accomplished. (It has been found in the case of any true oil-base mud, that as the water content increases, the weighting material in the course of time becomes water wet and tends to settle.)

In the past 12 years numerous commercial and noncommercial types of oil-base muds have been compounded. Actually, an oil-base mud is in essence a synthetic drilling fluid which has oil as its base instead of water. There are almost unlimited possibilities as to the types of so-called oil-base muds which could be

TABLE 1—LONG-RANGE OIL-PRODUCTION COMPARISONS, FOUR WATER-BASE VS. FOUR OIL-BASE COMPLETIONS (SAN JOAQUIN VALLEY, CALIFORNIA)
(Total average comparison)

	Well	Months	Oil production	Md. ft. sand	S.P.I. (last one)	Static pressure
Water base	A	87	496,800	25,300	.00531	3,145
	B	78	256,200	20,700	.00132	3,135
	C	84	260,200	21,000	.00129	3,165
	D	67	123,800	7,650	.00634	2,905
Total		316	1,131,000	74,650	.00826	12,440
Average		79	282,750	18,662	.00206	3,110
Oil base	E	94	663,400	24,000	.00284	3,170
	F	83	487,500	19,950	.00294	3,100
	G	52	205,200	17,820	.00345	2,935
	H	82	273,200	9,300	.00357	3,125
Total		311	1,569,300	71,130	.01280	12,230
Average		78	392,325	17,782	.00320	3,058

Using $2.55 as an average price per barrel, the additional profit realized from the four oil-base wells vs. the four water-base wells equals $1,117,665.00

1,569,300
1,131,000
438,300 bbl. more at $2.55 per bbl.

TABLE 2—PRODUCTION DATA FOR TWO CALIFORNIA FIELDS

Coles Levee

	Offsetting wells: Oil base	Offsetting wells: Water base
Initial production	11-10-45	6-18-45
Barrels per day	1,563	558
Cut, per cent	0.4	1.0
Flow bean (in.)	48/64	1
Later production		
Years later	4.64	5.03
Barrels per day	148	43
Cumulative production, Barrels to 7-1-50	285,860	109,740
Flow bean	(?)	(?)
Bottom-hole pressure at completion, psi.	3,635	3,580
Producing zone interval in feet	110	90
Type of producing zone	Oil sand	Oil sand
Approx. permeability, md.	60	60
Initial P.I.	1.42	0.144
P.I.—1 year later	0.470	0.0895

Remarks: As of 7-1-50 the oil-base completion produced 76,120 bbl. more oil in approximately 5 months less time. Using $2.55 as an average price per barrel, the additional profit realized is $194,106.

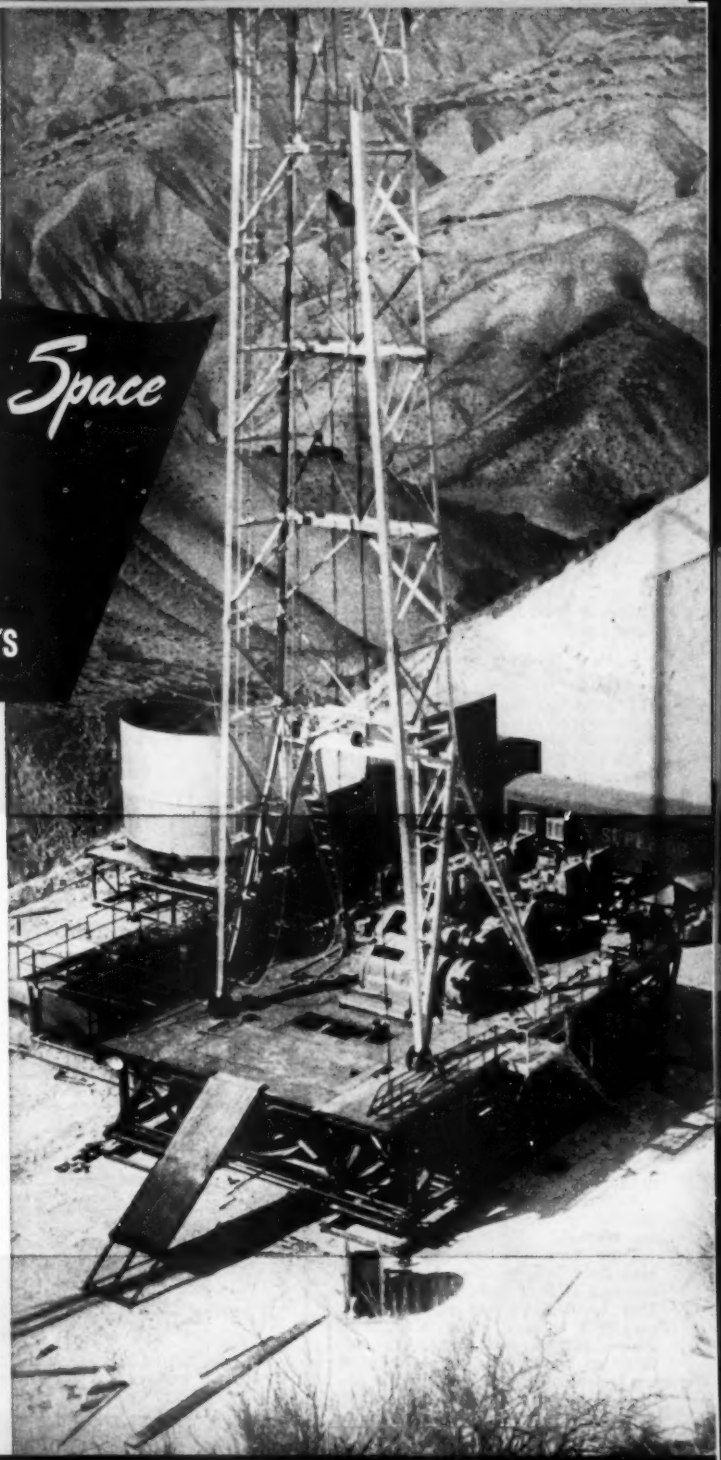
Wilmington

	Offsetting wells: Oil base	Offsetting wells: Water base
Initial production	9-1-46	9-25-46
Barrels per day	385	275
Cut	0	0
Flow bean	Pumping	Pumping
Later production		
Years later	3 1/6	3 1/4
Barrels per day	200	150
Cumulative production, Barrels to 1-1-50	314,969	260,421
Flow bean	Pumping	Pumping
Bottom-hole pressure, lb.	520	520
Producing zone interval in feet	450	450
Type of producing zone	Sand	Sand
Approx. permeability, md.	400	400
P.I. (10-17-46)	1.93	1.24

Remarks: These two wells are only 160 ft. apart on bottom. Same section is open in both wells. Completions were identical except for drilling fluid used. Pumping conditions are the same. As of 1-1-50 oil-base completion has produced 54,548 more barrels of oil using $2.00 as an average price per barrel, the additional profit realized is $109,096.

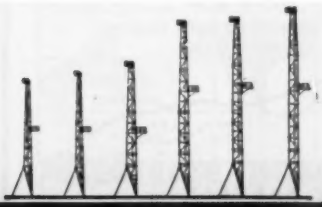
PLENTY OF *Working Space*
IS A FEATURE OF

LEE C. Moore MASTS



Pictured here is the bottom portion of a Lee C. Moore 133 feet Cantilever Mast. This picture illustrates the very generous floor space which is a feature of each Lee C. Moore Mast.

The rear legs of the mast are hinged to allow clearance for the largest drawworks.



LEE C. Moore

LEE C. MOORE CORPORATION

TULSA • DALLAS • HOUSTON • MIDLAND • SHREVEPORT • WICHITA • CENTRALIA • PITTSBURGH

Export Office — 9 Rockefeller Plaza, New York 20, N. Y.

created. However, to date, very few of these types, if actually more than one of them, will satisfy the requirements for an ideal type of oil-base drilling fluid. In general the types which have been created or used to date consist broadly of any of the following:

1. Air-blown asphalt.
2. Special air-blown asphalt[1] (only obtainable from California residuums at present time).
3. Soap.
4. Combination special air - blown asphalt and soap.
5. Combination air - blown asphalt and lampblack.
6. Combination air - blown asphalt, tall oil, and sodium silicate.
7. Oil-reactive bentonite.
8. Oil-reactive latices.
9. Refinery sludges, residuums, etc.

Of the above-mentioned types, those muds containing air-blown asphalt[2] have been the most successful due in part to their superior plastering properties and flexibility of temperature range.[1,2]

How Oil-Base Muds Differ

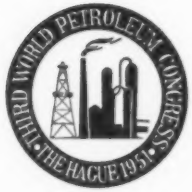
After several years of practical use, it became apparent that some oil-base muds were very limited in their performance possibilities. The main yardstick which may be used to judge the merits of any oil-base mud is as follows:

1. **Gel strength vs. viscosity.**—These properties relate to the suspending ability of the mud in regard to weighting material, drill cuttings, sand, etc. This relationship should be exceedingly stable, although flexible enough so that any practical desired degree of gel strength or viscosity can be easily maintained throughout the well temperature range.

2. **Plastering properties.**—These should be as nearly perfect as possible. Then a minimum of makeup oil will be required for viscosity control and secondly, an exceedingly thin filter cake will be deposited on the walls of the hole. Most important, if a filtrate loss does exist it should contain no harmful ingredients which will cause blocking of the producing zone.

At this writing there are three commercial oil-base muds available on the market.

Type "one" oil-base mud had a zero fluid loss at room temperature and had a 1.3 cc. fluid loss at 250° F. This small fluid loss at high temperatures consists of nothing more than slightly colored diesel oil, contains no water,[3] and the nature of the filtrate is such that it is entirely soluble in crude oil. The dark color of the diesel-oil filtrate is due to a very small amount of oil-soluble asphalt in solution and which remains in solution. If desired, this 60-minute high-temperature fluid loss can be reduced to zero by the addition of further plastering material.[1,2]



This is another technical paper from the distinguished meeting of the Third World Petroleum Congress held at The Hague, which the Journal publishes via exclusive arrangements with the congress and the author. The presentation here represents a thorough abstract. A limited number of complete reprints of the article, containing many detailed charts, tables, and illustrations, as presented at The Hague, may be obtained gratis by writing Oil Base, Inc., Compton, Calif.

Normally, the above-mentioned addition of further plastering material is not done because the filtrate loss is so small that no viscosity or oil makeup problems arise. Secondly, this small fluid loss is oil that does not contain any plugging materials.

Type "two" oil-base mud also had a zero fluid loss at room temperature. At 250° F., however, this type had a fluid loss of 2.5 cc. and in this test it was found that the filtrate consisted of a dark-colored diesel oil containing sodium silicate,* sodium tallate,† and 0.1 cc. of water. As such this type of filtrate would be harmful to the producing formation. The action and use of sodium silicate to make cement reservoirs, sands, etc., impervious to oil is well known.[4] It is also known that sodium tallate, when contacted by calcium or magnesium salts under the proper circumstances, will react to form a water - insoluble, partially oil-soluble, precipitate. This precipitate due to its degree of insolubility would be extremely difficult to remove from the pores of an oil-sand formation.

Type "three" oil-base mud had a filtrate loss at room temperature of 0.4 cc. This filtrate consisted of crude oil containing aluminum resinate‡ and a trace of water. At 250° F. this mud had a filtrate loss of 1.7 cc. In this test the filtrate consisted of 0.6 cc. of crude oil containing aluminum resinate, and 1.1 cc. of water. The harm due to the water in the filtrate has been previously pointed out and will later be shown. The presence of aluminum resinate in the filtrate can lead to an additional degree of permeability loss. This additional plugging action is possible because aluminum resinate, although oil soluble, when contacted by calcium or mag-

*Sodium silicate determined by the "ammonium molybdenum - benzidene hydrochloride" test.

†Sodium tallate determined by "Liebermann-Storch" test and flame test.

‡Aluminum resinate determined by a modified "Liebermann-Storch" test and conventional quantitative methods.

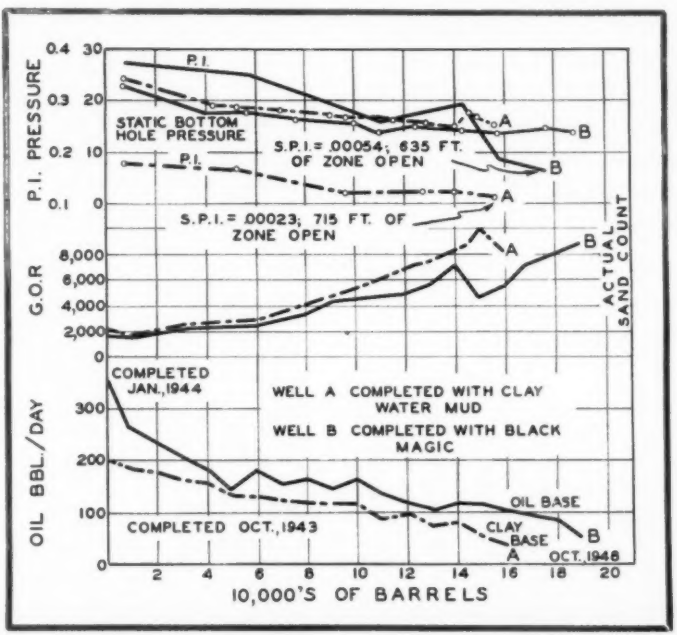


Fig. 1—Comparative well performance oil-base vs. water-base completion, Ventura area, California.

AMERICAN IRON

VALVES and SEATS

Designed Right! Made Right!

Get MORE from your pumps with these long-lasting valves and seats! They have many exclusive, field-tested features, as shown by this illustration. Both valve and seat are made from high grade alloy steel forgings, precision-machined. They're fully heat treated in our new controlled atmosphere furnace—the most advanced method of heat treating known!

AMERICAN IRON & MACHINE WORKS CO. A OKLAHOMA CITY U.S.A.

GO "AMERICAN" ALL THE WAY— with these American Iron Pump Specialties!

SOLD THRU SUPPLY STORES EVERYWHERE

160° Standpipe Gooseneck

180° Standpipe Gooseneck

Long Sweep Tee

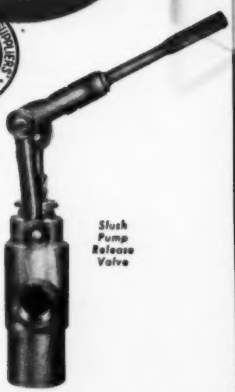
Long Sweep Ell with 2" Outlet

Long Sweep Full Flow Tee

Long Sweep Ell plain 90°

Long Sweep Ell plain 45°

Slush Pump Compounding Valve



Slush Pump Release Valve

AMERICAN IRON & MACHINE WORKS CO.

OKLAHOMA CITY, OKLAHOMA • BOX 1177 • PHONE L. D. 518
DISTRICT OFFICE: HOUSTON, TEXAS
EXPORT OFFICE: 11 WEST 42ND ST., NEW YORK CITY, N. Y.

MANUFACTURERS OF DRILLING EQUIPMENT • PRODUCTION EQUIPMENT • FISHING TOOLS **PUMP SPECIALTIES**

nesium salts, under the right set of circumstances (temperature, pressure, turbulence, etc.), will form a water-insoluble and only partially oil-soluble precipitate which would be difficult to remove from the area of deposition.

3. **Types of oil used.**—Bases for oil-base muds vary with the quality or cost of the product. Some manufacturers prefer to use crude oil; some, either crude oil or diesel oil; and others, a special type of diesel or refined oil.[6] Crude oil is normally used because of its availability or lower cost. Oil-base muds made with crude oil initially cost slightly less than muds made with a refined-type oil. When crude oil is used, certain definite disadvantages are entailed which far offset the slightly lower initial cost of the mud. As pointed out previously, crude oils which may be normally used for oil-base muds are seldom absolutely free of water or basic sediment.

Secondly, a notable fire hazard usually exists due to the lighter fraction content of most crude oils.

Third, normally in order to obtain good plastering properties when using crude oil as the base, many additional ingredients must be incorporated into the fluid, or larger proportions of the gelling and plastering agents are usually used.

Fourth, and most important, if an oil-base mud is made to remain intact and have stability of properties when utilizing crude oil as its base, then during completion of the well when the mud is displaced with crude oil, the mud cake will necessarily only be diluted rather than disintegrated. This situation, of course, prevents a maximum return permeability of the producing formation.

4. **Formation blocking.**—This is one of the most important factors. This concerns the comparison of the original oil permeability of the producing formation to the return oil permeability of this same formation after it has been subjected to the oil-base mud and the well is put on production.

5. **The air permeabilities** of actual cores have been found to be considerably different from the oil permeability of the same core (Miller, Morgan and Muskat). Even though salt water is less damaging than fresh water, the degree of damage in regard to the unit of no damage is such that there is little reason to believe that the use of salt water vs. fresh-water drilling muds would be much more beneficial to the problem at hand.

6. **Initial cost** of an oil-base mud may be quite a factor in determining its use. The four main factors affecting the cost of the mud itself are:

1. Nature of ingredients.
2. Flexibility of control.
3. Effect of water upon the mud properties.
4. Can economic regeneration be accomplished?

As pointed out previously, points (3) and (4) are of utmost importance to any oil-base drilling fluid, and at the present writing only one economical process of regeneration has been discovered which is in practical use.[7]

If an oil-base mud can be regenerated in respect to water content (all oil-base muds will pick up water during normal drilling operations from the formations drilled, climatic conditions, or inadvertent additions) and performance properties, and the operator is careful with wastage, it can be used successfully over and over again. It is a matter of record that one operator is still using some of the original type "one" oil-base mud he purchased over 8 years ago.

7. **Rig use.**—Oil-base muds vary in color from brown to black and appear, and probably are, more disagreeable from a cleanliness standpoint, to work with than water-base muds. With proper precaution and methods of use, many crews actually prefer to use oil-base muds.[8] Actually, it is possible to make an oil-base mud in almost any desired color, but since the base would still be oil, it is doubtful if the additional cost necessary would be warranted.

Some oil-base muds, due to their superior plastering properties, tend to cake upon contact with clothing. This feature, unlike oil-base muds with poor plastering properties or in cases where crude oil is used to drill with, makes these oil-base muds more agreeable to use.

In order to make the use of oil-base mud thoroughly practical, it is necessary to provide the drilling rig with equipment which today is normally used and considered only good practice. This applies regardless of the type of drilling mud contemplated. This equipment consists of:

1. Wood or steel flow ditches.
2. Wood or steel suction pits.
3. Oil-resistant pump parts.
4. Oil-resistant rotary hose.
5. A shale shaker (equipped preferably with a 12-mesh screen).
6. Reliable mud guns.
7. Sawdust or sand for the rig floor.
8. A drain line from the pipe-racking board to the flow ditch.
10. An understanding with the crew as to why the oil-base mud is being used.

Features Desirable in Oil-Base Muds

1. Advantages as a general-purpose drilling fluid:

(a) Possible to make a heavier (up to 160 lb. per cu. ft. or 21.4 lb. per gal.) or a lighter (56 lb. per cu. ft. or 7.5 lb. per gal.) weight drilling fluid than with any other type of mud available at the present time. This extra-heavy-weight mud can be made by using ordinary commercial barites.

(b) Can be used for drilling through salt domes, hydrous disintegrating shales, anhydrite, bentonite, cement, gypsum, etc., and is not affected by these contaminants.

(c) Will not gas cut if maintained with proper viscosity range.

(d) Has perfect plastering properties under normal A.P.I. testing procedure, i.e., a zero fluid loss which allows drilling of a "to gage" hole.

(e) Cementing is easily accomplished in oil-base mud. Due to the extremely thin mud cake deposited on the formation, a good bond is made between the cement and the walls of the hole. The hole cut with the oil-base mud is bit size, and therefore the tendency of the cement to channel is minimized.

Cement does not affect a desirable oil-base mud, and hence no difficulty is experienced during cement-drilling operations. Operators have found that oil-base mud is an excellent medium for plastic cementing procedures, and as low as 26-gal. jobs have been successfully accomplished.

(f) Desirable oil-base muds do not foam or ferment as may occur with some water-base muds.

(g) Oil-base mud has been found to be a definite directional drilling aid when it is normally necessary to run numerous whipstocks, use very slow circulation rates, and to drill pilot holes to gage.

(h) Oil-base mud has been used in conjunction with diamond coring in many areas with excellent results. Unlike water-base muds, it is not adversely affected by the slow circulating rates necessitated by diamond coring. In one deep Oklahoma field where extensive diamond coring has been done, it has been noted that in every case where water-base mud was used, considerable rig time was spent conditioning mud, while there was not 1 hour of mud-conditioning time shown on any of the wells using oil-base mud.

Another advantage in diamond coring is that very little fluid erosion of the matrix has been noted. This is probably due to the low solid content and inherent lubricating qualities present in this type of oil-base mud. Jamming of core barrels with shale cores has been virtually eliminated where the proper type of oil-base mud was used.

The cost figures (averaged from 10 comparable wells) obtained from a major oil operator in the Lindsay area of Oklahoma are as follows:

DRILLING OR CORING COST—DOLLARS PER FOOT
(Including rig time and bit expense only)

	—Bromide sand—		
	1st	2nd	Basal
Diamond core, oil base	41.60	43.40	34.80
Diamond core, water base	48.30	51.90	45.30
Drill with rock bits	21.20	50.50	105.50

For a section comprised of 150 ft., first Bromide, 190 ft., second Bromide, and 50 ft., basal Bromide, based upon the above

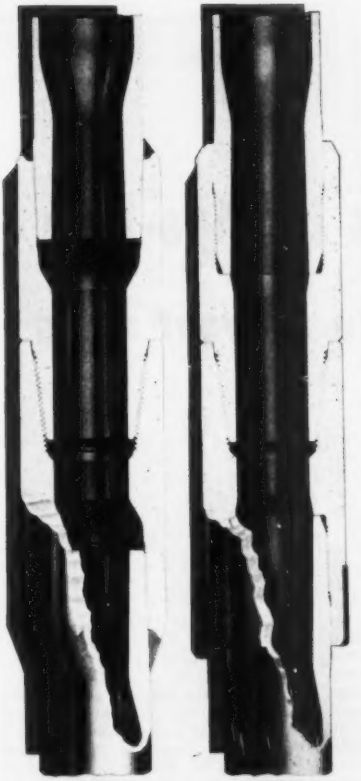
(Continued on page 120)

Heat treating characteristics—one of the most important factors to be considered in selecting a steel—are determined with the aid of this high-precision heat treating furnace.

Resistance to fatigue is being measured on this machine. A high fatigue resistance is an essential quality for steel used in oil field tools.

This Izod impact tester determines the impact resistance of a steel specimen. Steels used in **REED** products must have an exceptionally high resistance to impact.

This Brinell testing machine accurately determines the hardness of a steel. Hardness is closely controlled on all **REED** parts in order to get the best combination of strength and wear resistance.



REED
Counterbore Weld
TOOL JOINTS
Available in square shoulder or 18° bevel.

REED
Super Shrink-Grip
TOOL JOINTS

HOW REED RESEARCH MAKES POSSIBLE MODERN TOOLS FOR TODAY'S DRILLING

REED research is best known for the many basic design advances that make today's tool joints possible.

Less widely known—but equally important—are the metallurgical developments that make **REED** Tool Joints outstanding for strength, safety and wear resistance.

The **REED** research organization is working *today* on developments that will make *tomorrow's* drilling even safer and more economical.

REED
ROLLER BIT COMPANY

HOUSTON 1, TEXAS

NEW YORK LONDON BUENOS AIRES

Gulf Coast, Mid-Continent, Rocky Mountain and Canadian Distributor for Martin-Decker Products

3332

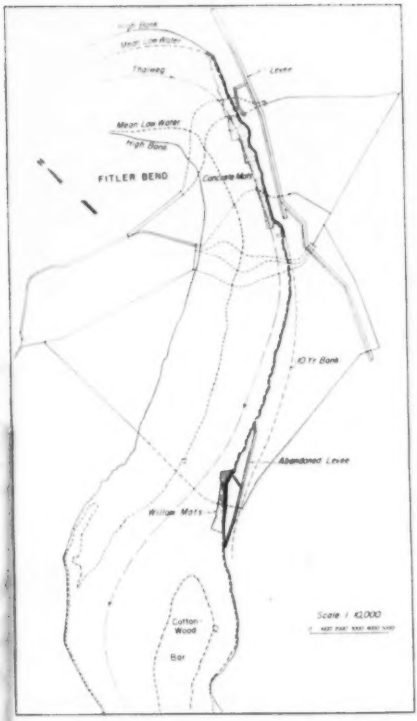


Fig. 1—Fitler Bend pipe-line crossing area of the Mississippi River, 30 miles above Vicksburg, Miss.

NOTE BY PAUL REED, JOURNAL'S PIPE-LINE EDITOR:

In his extensive studies of river conditions, the author has reached conclusions which differ widely from those generally held in the industry. Practices he has applied in the design and construction of a recent important Mississippi River crossing for Southern Natural Gas Co. are significant in the development of pipe-line techniques.

The author is a graduate of the United States Military Academy and M.I.T. While Gen. Omar Bradley commanded American Armies in Europe in World War II, Brig. Gen. P. H. Timothy was his chief engineer.

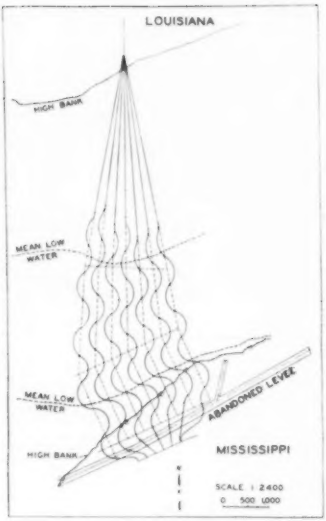


Fig. 2—Diagram of parallel lines with slack at crossing recently laid at Fitler Bend.

Breaks in Pipe-Line River Crossings—*and How to Prevent Them*

by P. H. Timothy*

THE practice of utilizing a uniformly weighted line as well as a line bowed either up or downstream is unsound. (See discussion contained in author's accompanying "Crossing Failures at Fitler Bend, Mississippi River.)

There have been two common incorrect assumptions in regard to streams: One presupposes a constant turbulence from bank to bank; whereas the other assumes uniformly varying bottom velocities. The two assumptions are inconsistent as well as erroneous, as the currents are neither constant nor uniformly varying from bank to bank.

In selecting a new site within the vicinity of Fitler Bend on the Mississippi River, not only were existing conditions considered but far greater importance was attached to a proper evaluation and analysis of the possible changes that could take place within the economic life of the crossing. Considerable time was spent in studying available records of this entire reach of river including hydrographic and topographic surveys, discharge data, and geological information of the banks and bed of the river.

Composite profiles and shore lines were compiled and studies were made to relate all changes to natural migrations or to artificial causes. Improvements affecting this reach of river such as cutoffs, revetments, and dredging were studied to determine the changes resulting therefrom. Only by means of such background information could a reasonable forecast be made as to future changes which could be anticipated at any given site.

Site Selection

Although extreme instability is generally characteristic of this entire section of the Mississippi River where banks are more or less continually accreting or receding and bottoms scouring or shoaling, a site was found which has been relatively stable for a number of years and which possible future changes indicate to be less hazardous than other locations. This site is 3 miles below the old crossings at Fitler Bend (see Fig. 1), and 1 mile above Cottonwood bar. It is below the crossover of the channel and well out of the Fitler pool. Here the bottom is wide and flat with maximum low-water depths of only 15 to 20 ft. compared to corresponding depths of about 70 ft. in the Fitler pool.

The western exits lie on the accreting Fitler Bend bar and the bank at the eastern exits has shown no perceptible change in over 30 years. Prior to 1937 the main channel ran eastward of Cottonwood bar and in 1917 willow mats were laid along the east bank which at that time was under attack.

To provide better channel easement and to alleviate heavy attack on the west bank below Cottonwood bar,

*Southern Natural Gas Co.

In 20 Years, 26 Pipe-Line Crossings of the Mississippi River Were Made at Fitler Bend. Of These, 20 Failed! WHY?

BEGINNING in 1929 a series of multiple pipe-line crossings of the Mississippi River have been constructed at Fitler Bend about 30 miles above Vicksburg (see Fig. 1). By 1949 a total of 26 lines had been laid at this location and after last year's high water only 6 remained in service. The 20 abandoned lines included some which had previously broken and been repaired. Following two breaks last March extensive studies and investigations were undertaken to determine the causes of failure and to design a new crossing to overcome such defects.

Beginning on page 243 of the October 4, 1951, issue of The Oil and Gas Journal, is a discussion of the causes of the breaks in the pipe lines at Fitler Bend together with the changes which should be made in future construction. The principal causes of failure and the indicated remedial measures are summarized, in part, below:

Scour.—The extent and depth of scour are functions of bottom velocities. At Fitler Bend high velocities and deep scours of 40 to 50 ft. are concentrated at the thalweg* in a deep and narrow gorge having a width of 600 to 700 ft. The pipe lines, which were laid at this location with the customary upstream or downstream catenary, are undercut at the thalweg during flood stages.

Elsewhere on the bottom, the lines generally remain imbedded. Hence, bowing the lines across the stream, with slack more or less uniformly distributed over about 6,000 ft., is ineffective as the amount of slack available in the short section where damaging scours occur is negligible. Adequate slack should, therefore, be provided where needed and not dissipated throughout the length of the line.

Hydrodynamic forces.—The uplift due to the hydrodynamic forces acting on a pipe at or near the bottom varies with the changes in bottom velocities or turbulence. It is maximum at the thalweg where the greatest turbulence occurs and decreases towards the banks with decreased depths. The periodic oscillations in intensity of these dynamic forces combined with the hydrostatic pressures produce sinuous wave motions in an inadequately weighted line with possible increased amplitudes due to resonance. These vibrations cause rapid fatigue or crystallization of the metal and ultimate fracture.

Weight as well as slack should not be distributed uniformly throughout the line but should vary in accordance with the resultant of the dynamic and static uplifts. The customary procedure, which was followed at Fitler Bend, of using a constant weight of line was not only erroneous but resulted in insufficient weight at the thalweg and too much at certain other locations.

Density.—During critical periods of high turbulence, the density of the water at the bottom of the channel due to the suspended and bed load materials is well in excess of that of fresh water upon which negative buoyancies are normally and, therefore, incorrectly based. As bed loads respond instantaneously to changes in velocity, the resultant density varies accordingly. It is, therefore, maximum at the thalweg and minimum at the bank on the bar side of the channel. The variation in density must also be considered in determining the proper weight of line at any point.

Caving banks.—Receding banks constitute a major hazard to pipe lines unless proper precautions are taken. At Fitler Bend the caving takes place in the upper portion of the bank which is mostly loam and which sloughs off almost vertically after the lower portion consisting of saturated sand flows out from beneath the superimposed mass. The upper part having a high angle of repose, especially when moist, is supported by arch and cantilever action until it collapses.

As the caving part of the bank lies above the low-water plane, the pipe lines should be laid in open trenches excavated to approximately low water. Although the trenches will fill during high stages, the material will be mostly sand and relatively free of loam and a tendency to cave. Accordingly, it is not believed that the current and costly practice of excavating banks similar to those at Fitler Bend to considerable depths below low water is justified.

*Definition of thalweg is "the line following the lowest part of a valley whether under water or not, or the middle or chief channel of a waterway."

dredging of a channel westward of the bar was started in 1937. This artificial shifting and maintenance by annual dredging of the channel to the west side of the bar has counteracted the accretions of the bar along the west bank and thereby has not only stopped the attack on the east bank at the site of the crossing but has caused considerable shoaling in front of this bank. Due to the wide, flat, and shallow bottom at this location, velocities are considerably less than at Fitler Bend and nowhere in this region do comparable scours take place.

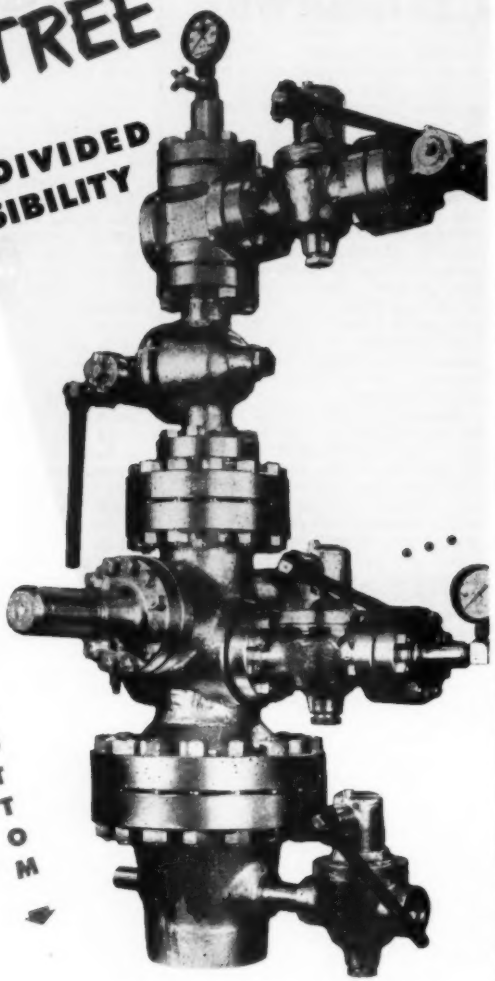
Forecast of Changes

Having selected the crossing, further studies were made to determine the nature and extent of changes that could reasonably be expected within the next 25 years. It is firmly believed that a design of any crossing of a meandering stream within an alluvial valley which is not based on such considerations invites disaster. It is also believed that many of the lines abandoned at Fitler Bend would not have failed had they been laid at this new site in view of the highly favorable conditions which have existed there during the past 30 years. A look at the future is by no means so encouraging. Above this new site lies a rapidly accreting bar along the west side of the river whose low-water shore line has moved eastward at an average rate of 150 ft. per year during the past 30 years.

The east bank at Fitler Bend is under heavy attack and revetment in the vicinity of the bite was commenced in 1907. The resulting accelerated recessions of the east bank below this revetment and above the new crossing site have attained rates of 300 to 400 ft. per year at certain locations. The purpose of the revetment is to stabilize the bank and to prevent it in effect from being pushed farther back by the accreting bar on the opposite side of the river. Although the reveted bank can no longer give as the bar continues to build up, the bottom gives instead and the effects of the increased velocities due to the restricted channel are transmitted downstream. In 1949 the Fitler revetment was extended downstream about 1 mile. To fully stabilize the east bank and avoid additional setbacks of the levee a further extension of the revetment would be required and such an undertaking at some future time is quite likely.

The principal changes that might occur at this crossing depend upon whether or not the Fitler revetment is extended. In either case the resulting changes would be accelerated and intensified by discontinuance of maintenance dredging west of Cottonwood bar. Therefore, the principal changes on which the design is based are as follows:

1. **No extension of the Fitler revetment and discontinuance of maintenance dredging.** In this case recession

BUY THE
ALL-CAMERON
TREE
AND UNDIVIDED
RESPONSIBILITY
FROM TOP TO BOTTOM

PREMIUM QUALITY
Cameron
FORGED STEEL
at NON-PREMIUM PRICES

of the east bank below the present Fitler revetment will continue at decreasing rates. The willow reveted bank at the east exits of the crossing will be outflanked from above. An estimated 10-year high bank is shown in Fig. 1. The recession of the east bank at the crossing during the next 10 years would be about 1,000 ft.

2. **Extension of the Fitler revetment and discontinuance of maintenance dredging.** In this case further bank recession would be slight, if any. A rapid extension of the Fitler pool below the crossing site will result. A deepening and narrowing of the channel to low-water depths of 50 to 60 ft. together with maximum velocities approaching those at Fitler Bend can be assumed.

Smaller Lines Selected

Consideration had been given initially to the utilization of a crossing consisting of two large-diameter lines dredged below bottom scours and into the east bank beyond the extent of recession. However, after a little study of the characteristics of this reach of river, it appeared increasingly hazardous to base a design on any such rigid assumptions. Furthermore, after some idea was gained as to the extent of scour and recession that could be expected during the life of the lines, the estimated cost of dredging alone exceeded the overall cost of a multiple crossing.

Design of Crossing

The crossing as designed and constructed is shown in Fig. 2. The lines are laid straight from the header on the Louisiana side across the accreting bar to areas where appreciable scour begins to take place on the channel side of the bar. The amount of slack is increased from an offset of 100 ft. in 600 to 150 ft. and 200 ft. in 600. It is estimated that the 200-ft. offset will readily accommodate a scour of about 75 ft. in 600, which is well in excess of any than can reasonably occur at this location.

Maximum slack is used where maximum scours can be expected, and is carried across the Mississippi bank to the vicinity of the headers to provide for the recession of the bank. The Mississippi header is located about 1,200 ft. from the present bank and behind the 10-year bank line. It can be moved farther into the bank when and if the bank recession necessitates.

Five different weights of line are used to offset the varying uplifts and densities. The ticks on the drawing of Fig. 2 indicate where changes in weight are made. The minimum weight is used on the Louisiana bank and the high part of the bar adjacent to that bank. The maximum weight is used where maximum turbulence can be expected and is carried across the Mississippi bank to the vicinity of the header. If the Mississippi head-

er is moved back, the same slack and weights will be extended to the new header. For protection against caving banks, the Mississippi bank was trenched along the axis of the lines. The trench extended down to about the low-water plane and backwards to a point 200 ft. from the top of the high bank. The six downstream lines are 10¾-in. o.d. with ½-in. wall on the bar and ¾-in. in the channel. The seventh line is 12¾-in. o.d. pipe with ½-in. wall.

Cast-iron clamps of 400 and 1,000 lb. are used on the 10¾-in. lines and 1,800-lb. clamps are used on the 12¾-in. line. The 10¾-in. pipe was used because it was either on hand or on order. Otherwise the 12¾ by ½-in. pipe would have been desired for all lines as it is equally or more satisfactory in every respect. It not only has almost twice the capacity of the 10¾ by ¾-in. line, but it weighs 15 lb. per foot less and costs no more to lay.

Conclusions

In conclusion, it is desired to state that the foregoing analysis and design were derived with an open mind and without prejudice against either a multiple crossing or a large-diameter crossing dredged beyond estimated scours. The latter type of crossing was initially considered in line with the trend of present practice but was rejected for this site for the following principal reasons:

1. **Constantly varying conditions** together with the uncertainty of estimating future changes preclude a rigid construction and indicate the necessity of flexibility in design to "give with the punch" and to conform to possible but unpredictable changes.

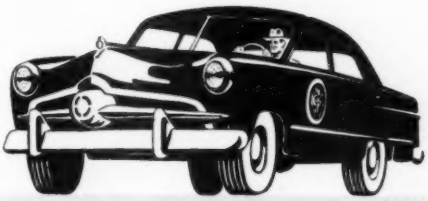
2. **A large-diameter line** with heavy wall thickness and encased in concrete is inflexible and must be buried beyond possible scours or erosions.

3. **Scour data.**—Not only is a continuous history of scour not available at crossing sites but such intermittent surveys are not obtainable may be misleading and, accordingly, future estimates must necessarily be highly uncertain. The degree of such uncertainty is directly proportional to the probability of failure.

4. **Dredging.** — Disregarding astronomical costs, the limitations of even the most powerful dredges would not permit burying the line beyond scours and erosions believed possible at the Cottonwood site. A compromise based upon the assumption that continuous observation, especially under severe conditions of flood and drift, would permit further dredging in time to prevent failure borders in my opinion is wishful thinking. Not only are observations difficult under such conditions but work could not be undertaken at best until the following low-water season.

...AND CAMERON FIELD SERVICE

matches Cameron Xmas Trees in Quality and Dependability!

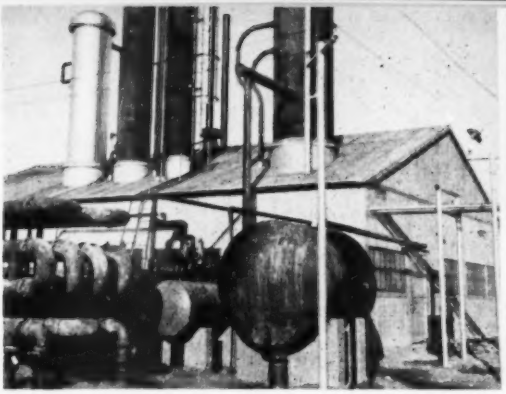


Cameron

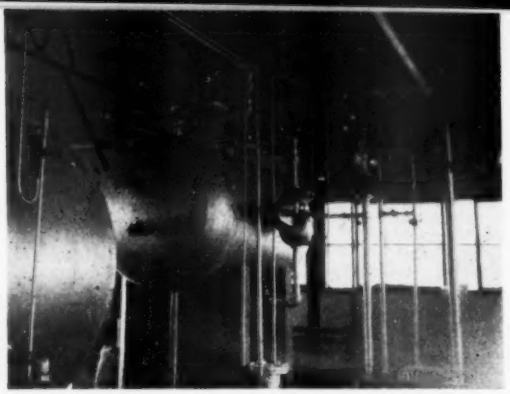
IRON WORKS, Inc.

P. O. BOX 1212 • HOUSTON, TEXAS

Export: 74 Trinity Place, New York, N. Y. Represented in sterling area by: British Oilfield Equipment Co., Ltd., Duke's Court, St. James's, London S.W.1, England



This view of an installation at Cut Bank, Mont., shows the plant's main building. Note method of carrying columns through roof.



Interior of building for the winterized natural-gasoline plant at Cut Bank. View shows accumulators with their various controls.

Here's more light on

"Winterizing" Natural-Gasoline-Plant Operation

by Henry N. Wade*

AUTHOR'S NOTE: It is thought that the accumulation of over 20 years' experience in building natural-gasoline extraction plants and compressor stations in some of the coldest parts of the United States may present some general ideas of interest to operators. This seems particularly pertinent at this time, in view of the rapid late development of oil and gas reserves in the northern states and in the southern part of Canada.

EXPERIENCE has shown that, with a reasonable amount of planning in the design of a plant, operating troubles resulting from cold weather can be eliminated. In fact, it has been remarked that some of the plants in the coldest areas, designed with extreme winter weather in mind, have actually been easier to operate than plants located in warmer locations where only occasional cold "snaps" are experienced, and consequently, the designers did not make provision for cold protection.

Some of the plants that form the basis for the design suggestions to follow have been operating for many years in locations where the temperature occasionally reaches minimum points as low as minus 45° F., and where periods of several weeks with maximum temperatures not higher than 0° F. are taken as a matter of course.

The main sources of trouble in gasoline plants and compressor stations resulting from cold may be divided roughly into the following types of difficulty:

1. Freezing of water lines.

2. Excessive ice formation in water-cooling towers.

3. Freeze-ups in "dry" or radiator type coolers.

4. Freezing in connections and inside of cases of liquid level controllers.

5. Freezing of pressure pilot lines running to pressure controllers or instruments.

Freezing of water lines

On account of the high heat capacity of a stream of water flowing through a line, it is usually not possible for a water line to freeze as long as a plant is in operation. If a shutdown occurs during extremely cold weather, however, such lines may freeze up quickly unless they are protected or drained free of water.

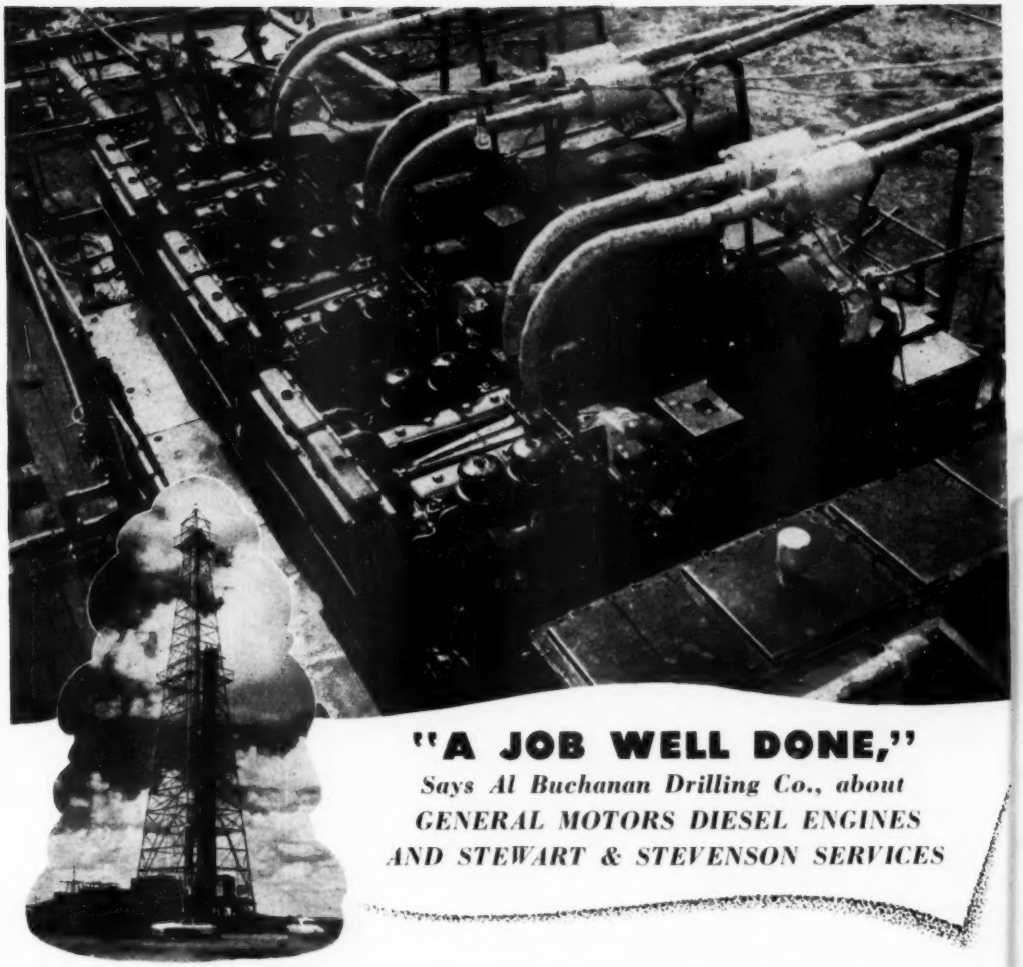
For long water lines the simplest kind of protection is, of course, burial in the ground to depths safely below frost line. Even in such buried lines freezing can occur rather rapidly near ground level unless means are provided for completely draining them. This may mean running a drain line from the system at a level below frost line to a gulley or some other depressed point, where the drainage water can be disposed of. Such a drain line must be laid with an even grade toward its outlet, and with its shutoff valve buried or otherwise kept warm as close as possible to the piping to be drained, so that the drain line will drain free when it is not in use. If this precaution is not observed the drain itself may freeze in a sag.

In jacket water or other closed cooling systems where water is scarce, or where shutdowns are frequent, draining out the system upon shutdown may be awkward or impossible. Such conditions often occur at booster compressor stations which are required to operate only intermittently under peak-load conditions. In such situations often it is practical to fill the closed circulating system with a mixture having a low freezing point, such as water and methyl alcohol, or water and ethylene glycol or Prestone. In designing systems to use such low freezing mixtures, it should be remembered that the specific heat of the mixtures is much lower than that of water alone, and consequently the rate of circulation must be nearly doubled in most cases to secure the same amount of cooling with a given temperature rise.

It is possible, of course, to use inorganic salts such as calcium chloride, or common salt, for making the low-freezing solution. However, these solutions are generally quite corrosive

PLANT POINTERS

*Consulting engineer, Stearns-Roger Mfg Co



"A JOB WELL DONE,"

Says Al Buchanan Drilling Co., about
GENERAL MOTORS DIESEL ENGINES
AND STEWART & STEVENSON SERVICES

This Al Buchanan Drilling Company rig, shown on a location just a few miles north of Midland, is truly one of the oil industry's "big guns." Its towering, heavy duty derrick stands 136 feet high and the rig is powered by three General Motors Diesel Engines, totaling over 1000 maximum horsepower. About the engines, they report:

"These engines were placed in operation in July, 1950, and to date have drilled many thousands of feet of hole. These engines have been very satisfactory and we think Stewart & Stevenson perform a good service for the oil industry and one that is vitally needed. You have our permission to use our name and quote us on a job well done."

Yes, Al Buchanan Drilling Company is another of the industry's leading drilling contractors who have given their endorsement to GM Diesel Engines and Stewart & Stevenson Services. Let us tell you the full story of GM Diesel Engine dependability, economy and flexibility. Call your nearest Stewart & Stevenson representative today. No cost or obligation.

STEWART & STEVENSON SERVICES, Inc.

Main Office and Plant: 4516 Harrisburg Blvd., Houston 11, Texas. Phone WOodcrest 9691
Branches: Corpus Christi, Dallas, Lubbock, McAllen, Wichita Falls.
Representatives: San Antonio, Waco, Longview, Brownsville, Breckenridge.
Distributors of: General Motors Diesel Engines, Continental Red Seal Engines, Chrysler Industrial and Marine Engines, Chicago Pneumatic Engines, Petter Diesel Engines, Gardner-Denver Pumps.
Fabricators of: Electric Power Units, Electrical Control Equipment, Portable Pumping Units, Truck Bodies, Hurricane Stalk Shredders.

PARTS... SERVICE
STEWART & STEVENSON SERVICES, INC.
Anytime Anywhere

THE NATION'S LARGEST DISTRIBUTORS OF GM DIESEL ENGINES

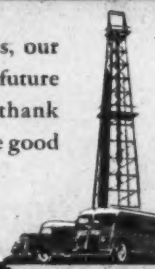
Tomorrow's Tools -Today!

Our constant guide through

20 Years of Progress

—progress through service to America's oil-producing industry

As we look ahead on this, our Twentieth Anniversary, to future decades of service, we thank our many customers whose good will and cooperation has made possible our steady growth and continuous improvement in equipment and service facilities.



Pioneer in Radioactivity Well Logging Service

Pioneer in Gun Perforating Service

LANE WELLS

TECHNICAL OILFIELD SERVICES

Los Angeles • Houston • Oklahoma City • Lane-Wells Canadian Co. in Canada • Petro-Tech Service Co. in Venezuela
General Offices, Export Office and Plant • 5610 So. Soto St. • Los Angeles 58, California

73 Locations to Serve Every Active Oil Area

AG-50

to iron and steel, and hence, are not commonly used. They also have low specific heats like the organic anti-freeze compounds.

Excessive ice formation in water-cooling towers

In the newer types of induced-draft cooling towers, it is comparatively easy to avoid trouble from ice formation by regulating the number of fans operating, by controlling the speed of the fans if such control is provided, or by limiting the flow of air through the tower by means of shutters or curtains. By using one or more of these expedients, it is easily possible to keep the temperature level within the tower comfortably above freezing.

For the older type towers, where exposure of water spray or drip depends mainly on wind velocity, it is usually necessary to provide some means for diverting the water from the upper part of the structure so as to reduce the amount of water surface exposed, and thus keep the temperature at safe levels. This is often done by providing an auxiliary header a deck or two above the bottom of the tower, valved so that the normal upper distribution can be shut off entirely and the exposure of the water limited to the bottom one or two decks. In some cases where the tower is not called on to dissipate a very large heat load, sufficient cooling may be obtained during extreme weather simply by circulating the water into and out of the cooling-tower basin.

Freezeups in "dry" or radiator-type coolers

In many of the extreme northern locations the range of ambient temperature may be startlingly wide. For example, in parts of northern Montana which may experience extreme winter temperatures as low as minus 50° to 55° F., it is not uncommon to have peak mid-summer temperatures as high as 100° to 105° F. It is obvious that, in order to have adequate cooling at all times, the cooling surface and the air circulation through the radiator must be designed to take care of the worst summer condition. When the plant is exposed to the extreme winter cold, the surface is obviously too large, and the fluids inside the tubes are almost certain to freeze unless some method is used for controlling the circulation of air.

The most reliable method of controlling such freezeups is to provide some means for recirculating heated air from the discharge side of the radiator so that it is impossible for untempered outside air to reach the radiator at any time. If such recirculation is not provided, and control is attempted through limiting the rate of air discharge only, it is perfectly possible for part of the radiator to freeze due to irregularities in the pattern of the in-flowing stream of air. Such freezing can damage radiator tubes and headers without giving the operator any warning that anything is happening, since the circulation through the system outside of the radiator may be at normal rates and temperatures.

It is obvious that radiator-type coolers must be provided with means for quickly draining all parts of them upon shutdown, unless, as in the case of jacket-water systems, anti-freeze mixtures are used. In practically all designs of radiator-type coolers, the surface exposed to the cold air is relatively enormous as compared to the cross-section of the passages inside the tubes, and hence freezing can occur very quickly.

Freezing in connections and inside of cases of liquid-level controllers

Freezing of liquid-level controls is one of the most troublesome things in the operation of plants in intermediate weather zones, where specific protection is not provided. Such freezing trouble usually accounts for a large part of the disfiguring and wasteful "steam hoses" commonly seen in such plants during cold spells.

Perhaps the simplest way of protecting level controls is to use the type in which the float and lever arm are mounted inside of the vessel, and only the pilot mechanism is on the outside. Ordinarily, level controls of this type will operate satisfactorily in the coldest weather. However, many operators object to the internal-float-type liquid-level conrol, since a mechanical failure of such a controller involves a shutdown.

Where external float controls are used in temperate climates, it is often possible to get sufficient protection by simple insulating the case of the controller and its connections to the vessel. This is particularly true where the vessel to which the control is attached runs fairly hot.

On cold vessels or in more severe climates it may be necessary to add heat by running "tracer" lines of copper tubing wrapped around the piping connections between the vessel and the float case, and around the float case itself. These tracer lines are supplied with steam at low pressure during cold weather.

Still another expedient which has been satisfactory for the protection of float controls under quite severe weather conditions is to fit around the case and its connections a wooden box, preferably sheathed on the outside with sheet metal and heated on the inside with a small coil or series of loops of copper tubing supplied with steam. Such a box must, of course, be fitted with a door to permit access to the controller for adjustment or repairs.

Probably the most satisfactory way of eliminating all trouble with liquid-level controls, control valves, traps, drains, etc., is to house all equipment, including cold vent and surge tanks and the bases of all columns in a weathertight heated building. Such an arrangement eliminates all trouble from freezing and sticking, and in addition makes it much easier for the operators to keep the equipment in proper operating condition during cold weather.

The earliest installation of this kind within our experience is shown in the photograph of the old Cut Bank absorption plant of Montana Power Gas Co., which was built in the fall of 1932. Troubles at this plant caused by cold weather were negligible from the start, due to the use of housing over the mechanical equipment and controls. In this case everything except main oil heat exchangers, a hot vent tank, and the cooling surface inside the cooling tower were completely housed. The boilers and their auxiliaries were in a separate building at a safe distance from distillation unit. At this particular plant temperatures as low as minus 45° were experienced several times during the startup; nevertheless no trouble was experienced with freezeups.

The photo of the Huntsman plant of Ohio Oil Co. near Sidney, Neb., illustrates a plant with a somewhat more elaborate form of housing. Here the condensers and reflux accumulators are mounted on a three-story steel structure above the pumps, requiring an unusually tall building. *(Detailed engineering article on Ohio's Huntsman natural-gasoline plant appeared in The Oil and Gas Journal, March 3, 1952, page 72.)*

Freezing of pressure pilot lines

Transmitting pressure from vessels or lines to control instruments is one of the most troublesome small problems under cold weather conditions.

Where a large enclosing structure is used, as at the Huntsman plant, almost all such lines can be kept inside the structure and hence can be kept above freezing temperature at all times. However, it may be necessary to run lines outside to an orifice fitting or to bring in the pressure from some more or less remote point for operating a recorder or controller. Several expedients have been devised for taking care of such situations.

One of the simplest schemes, where the pressure to be measured is in an oil or gas line, is to provide a fairly large pressure reservoir at the pressure tap, and to fill this reservoir and the pilot line clear up to and into the instrument with Prestone or some similar antifreeze material. If this

scheme is used, it is obviously necessary to be absolutely sure that every part of it is driptight, since loss of the glycol is expensive and also would upset the calibration.

In calibrating the instrument, allowance must of course be made for the difference in hydrostatic pressure, if there is a difference in the level between the instrument and the reservoir.

If the fluid flowing through the line is water, the pilot line and reservoir can be filled with kerosine or some similar light oil, with an inverted trap at the connection to the line so that the water pressure is applied underneath the oil.

In this case it is necessary to have the connection in a vault at a sufficient depth to protect against freezing, or else provide some form of external heat.

Sometimes the only feasible way of protecting long pilot lines is to bundle them together inside of insulation and provide heat by means of tracer lines as discussed.

In many instances where a small amount of heat is needed at a remote point, it may save money and trouble to provide such heat electrically. If the equipment to be heated is small and can be enclosed in a weathertight box, such electrical heat could be provided cheaply by installing an electric lamp inside the box. If the location is hazardous, the lamp must of course be properly protected.

Another form of electrical heat which is convenient for protecting long pilot lines is manufactured by several companies in the form of lead-covered heating cable. This material is available in units of various lengths, up to several hundred feet, and with various wattage capacities. Such heating cable may be very much cheaper and easier to apply than steam tracer lines.

Hydrocarbon Extraction By Refrigeration

(Continued from page 100)

pression. Each of these machines is multipurpose in that it is designed to handle more than one of the services mentioned above. Four of the machines are each equipped with four compression cylinders. Two of these cylinders are designed for residue-gas service, while the remaining two handle the first and second-stage flash gas services respectively. The other two machines also have four compressor cylinders apiece. In the latter case the first two cylinders are designed for residue-gas compression, the third for first-stage flash gas, and the fourth for reactivating gas.

The speed of each of the compressors is controlled from a common source to maintain the desired plant feed gas rate. The speed-control governor on each of the machines is actuated by differential pressure controller. This instrument maintains a fixed pressure drop in the feed-gas stream across the feed-gas flow controllers and dehydrators by controlling the rate at which residue gas is withdrawn from the process.

In order to secure the desired compression characteristics for the flash-gas and reactivating-gas services, clearance pockets are provided in all compressor cylinders. These clearance pockets must be manually adjusted to balance compression loads among the three services and insure the desired compression ratio and capacity for each service.

Refrigeration

A conventional ethane-propane cascade-type refrigeration system is employed in this plant to provide low-level ethane refrigeration at —96° F. and intermediate-level propane refrigeration at —15° F. Under this system, ethane refrigerant is circulated in a closed system and condensed with propane refrigerant which also circulates in a closed system, and, in turn, is condensed with cooling water.

In the ethane refrigeration cycle, liquid ethane flows to the feed-gas coolers (and to the deethanizer condensers). Exchangers utilize refrigeration available in low-temperature process streams to cool the liquid refrigerant and to reduce the amount of liquid required for a given refrigeration load.

The ethane is vaporized at 19.7 psig. and —96°F. in the feed-gas coolers and the vapor flows through an exchanger to the compressor suction. The ethane liquid-vapor exchanger serves a dual purpose in that it recovers valuable refrigeration from the low-temperature vapor stream and at the same time warms the vapor sufficiently to permit safe operation of the first-stage compressor cylinders.

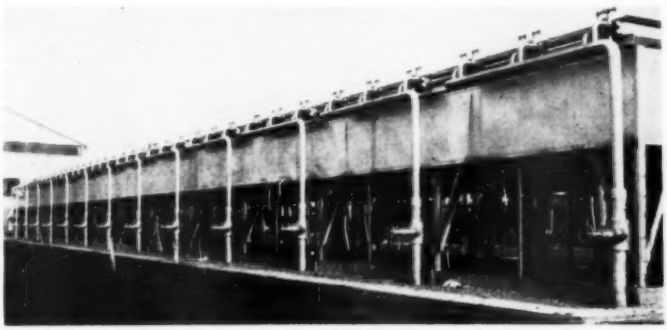
By warming the vapor to —15° F. any entrained liquid droplets will be vaporized before entering the compressor. Low-temperature alarms are provided in the ethane compressor suction line. These alarms flash warning signal lights in the control house and compressor house if the vapor temperature drops to —25° F. and automatically shut down the compressors if the temperature drops to —50° F.

The ethane vapor is compressed through two stages from 14.8 to 200 psig. Suction pressure is held constant by controlling the compressor speed through the action of a pressure controller. Compressed vapor is aftercooled to 94° F. and partially condensed in exchangers. These exchangers utilize refrigeration available in low-temperature process streams to reduce the load on the propane-cooled ethane condensers. Partially condensed ethane is totally condensed at —5° F. in the main ethane condensers and returned to the storage tank thus completing the ethane refrigeration cycle.

In the propane refrigeration cycle, liquid propane flows into the interstage flash drum. As the liquid enters this drum, under level control, its pressure is reduced from about 190 to 63 psig., a portion of the liquid is vaporized, and the stream is self-refrigerated to 40° F. The refrigeration effect of interstate flash operation improves the efficiency of the propane refrigeration system by reducing the amount of propane which must be circulated through the low-pressure side of the system for a given refrigeration load.

Vapor from the interstage flash drum is taken directly into the second-stage suction of the propane compressors. In order to avoid the possibility of liquid carryover into the compressors, the flash drum is provided with a metal-mesh separator element which will remove entrained droplets and with high-level alarm controllers which guard against liquid overflow. These instruments actuate signal lights in the control room and compressor house if the liquid level rises above normal operating limits and shut down the compressors if the level continues to rise.

Propane liquid from the interstage flash drum flows into the shell side



Air-cooled jacket-water coolers for compressors and auxiliary gas engines. Compressor building is at left.

For every job on the water!

RUGGED WORK . . . driving this heavy oil exploration rig in shallow, reef-strewn waters. Evinrude *outboard* power was the obvious answer. *No other type* of marine engine could do the job so efficiently, or at comparable low cost.

Count the advantages and savings: (1) Moderate initial costs. (2) No complicated — and expensive — installation work. No "extras." (3) Complete portability—motors are instantly attachable, easily transferred from hull to hull. (4) No sacrifice of equipment, cargo or crew space. (5) Simple to operate and service. (6) Safe operation in shallowest waters.

For large work boats and fast ferry service, the "Big Twin" (illustrated at left) is an exceptionally satisfactory power plant, delivering 25 B.H.P. in continuous heavy duty service. Gearshift with Neutral-Forward-Reverse gives full maneuverability, and separate Cruis-a-Day Tank provides long-range fuel supply.

Other Evinrude models 3, 7.5 and 14 horsepower. For descriptive literature write EVINRUDE MOTORS, Dept. C, 4809 N. 27th Street, Milwaukee 16, Wisconsin.

In Canada: Manufactured by Evinrude Motors, Peterborough, Ontario

EVINRUDE OUTBOARD MOTORS

of ethane condensers, the deethanizer condenser, and the makeup tower condenser. Individual level controllers mounted on the shell of each of these exchangers govern the rate at which the propane is admitted. Propane vaporized in these units at —15° F. and 13.3 psig. flows through the propane suction separator into the low-stage compressor cylinders. The separator drum is sized to remove entrained liquid droplets from the vapor stream and contains a heating coil to vaporize any liquid collected. Hot propane vapor from the compressor second-stage discharge is used as the heating medium in this coil. High-level alarm controllers actuate signal lights in the control and compressor houses if the liquid level rises to a predetermined point and shut down the refrigerant compressors if the separator liquid level continues to rise.

Propane vapor from the suction separator is compressed from 11.8 to 60.9 psig. in the first-stage compressor cylinders. Vapor from the interstage flash drum joins this stream in the interstage header and the combined streams are compressed to 200 psig. in the second stage. The high-pressure vapor is totally condensed in water-cooled propane condensers and then flows into the propane storage drum, thus completing the propane refrigeration cycle.

Seven identical 1,760-hp. reciprocating compressors are provided for refrigerant service. Each machine is equipped with four compressor cylinders, two of which handle the first and second-stage propane service while the other two are designed for first and second-stage ethane compression. As mentioned previously, compressor speed is automatically varied to maintain a constant ethane suction pressure. In order to balance ethane and propane compression loads and to secure the desired propane suction conditions, clearance pockets are provided on all compression cylinders.

Separators are provided downstream of the compressors in both the ethane and propane systems. These units are designed to remove lube oil which the refrigerant streams may pick up in passing through the compressor cylinders.

A refrigerant dehydrator is provided for the common use of the two refrigeration systems. This unit contains alumina desiccant for adsorbing water from the refrigerants and incorporates all necessary equipment and controls for reactivating the desiccant and disposing of the adsorbed water.

Refrigerant makeup. — Facilities have been incorporated in the plant to produce substantially pure ethane and propane for the refrigeration systems. It is estimated that approximately 1 lb. per brake horsepower per month of refrigerant will be required to make up for system losses. On this basis the quantity of ethane required as makeup per month will be about 1,500 gal. and the quantity of propane about 1,000 gal.

When the plant is in normal operation the refrigerant makeup tower is operated periodically as a batch still to produce ethane and propane makeup for the refrigeration systems. The tower is 24 in. in diameter and contains 15 ft. of Berl saddles as packing. It is equipped with a steam-heated reboiler and a propane-refrigerated reflux condenser. A differential pressure controller maintains a constant pressure drop across the packed section to prevent flooding by acting in conjunction with a flow controller to control reboiler heat input. Feed for the makeup tower is taken either from the deethanizer reflux or bottom product, from the deethanizer reflux when ethane is to be made, and from the bottom product when propane is to be made.

Steam is supplied by a package-type steam-generating unit. This unit consists of boiler, combustion equipment, mechanical forced draft, and boiler feed-water return system complete with necessary fittings and controls. The natural-gas-fired, water-tube-type boiler has a rated capacity of 12,000 lb. per hour of steam from and at 212° F. Its maximum pressure rating is 160 psig. but it will normally operate at or below 100 psig.

Condensate is returned under steam pressure from the steam traps to the vented condensate receiver and is pumped into the boiler feed pumps. Treated water is used for boiler feed makeup.

Fuel Gas

Process vent-gas streams constitute the normal source of plant fuel. The compressor fuel system operates at 25 psig. and receives most of its fuel from the second-flash vapor stream. However, this stream is insufficient to meet the total compressor fuel demand, so a small portion of the first-flash vapor stream is used to make up the deficit. A pressure controller allows enough of the 135 psig. first-flash vapor to bleed into the compressor fuel system to maintain the desired 25 psi. pressure in that system.

The auxiliary system normally receives all its fuel from the first-flash vapor stream. The 135-psig. gas is taken from the flash vapor compressors' first-stage suction header, throttled through a pressure controller and distributed through the system at 25 psig. Gas is piped at 25 psig. to the reactivating gas furnace, employe's cottages, calorimeter building, the office building, warehouse, garage, and water-treating building. A second pressure regulator reduces the pressure to 1 psig. for use in the electric generators, and the auxiliary building heating system. An emergency and makeup fuel supply is furnished from the feed gas to the plant through a pressure controller which reduces the pressure from the main-line pressure to 25 psig.

Water Supply and Treatment

Water is drawn from the Green River through twin intake caissons and is pumped to a 300,000-gal. capacity storage tank near the plant site by means of two vertical turbine-type deep-well pumps.

From the storage tank water flows by gravity to the water-treating building where it is treated for boiler makeup, jacket cooling, and building service.

The water-treating plant is designed for a continuous rated net output of 30 g.p.m. with capacity to handle 60 g.p.m. when all filter and softener units are in operation. Treatment is accomplished as follows:

Coagulant feed.
Filtration.
Sodium zeolite softening.
Hypochlorination.

The water to be treated is first pumped to an elevated storage tank from which it flows by gravity to the inlet lines of two 4-ft. 6-in. diameter, Apexier-lined, sand and gravel pressure filters for removal of suspended material. The pressure filters are arranged to operate in parallel with all operations associated with backwashing controlled by a multiport valve.

As an aid to filtration, a coagulant is fed in the form of a preformed alum floc. The floc is prepared in a 2-ft. 6-in. diameter Heresite-lined tank provided with motor-driven agitator for effective mixing and is then delivered to the filter units.

Following filtration the water is next pumped to the influent lines of two 2-ft. 6-in. diameter Heresite-lined, softener units where calcium and magnesium hardness is removed by ion exchange. The softeners are arranged to operate in parallel with all operations associated with backwashing and regeneration controlled by a multiport valve. Equipment for preparation of brine regenerant consists of one 2-ft. diameter, galvanized steel, salt storage and dissolving tank and two 15-in. diameter, galvanized steel brine measuring tanks (one per softener) all complete with controls and accessories.

A two-cell, induced-draft, coil-shed-type cooling tower is utilized to cool about 6,000 g.p.m. of water from 102° to 84° F. The major portion of the cooled water is passed over atmospheric cooling sections located within the tower structure, collected in a sump, and recirculated to the top of the tower. The remainder of the cooled water is collected in a separate sump, pumped through the plant cooling water circuit, and returned to the top of the tower.

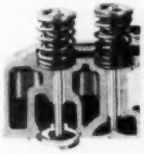
The plant was designed and constructed by Stone & Webster Engineering Corp., of Boston.

Here's Why!

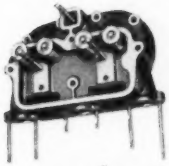
ALLIS-CHALMERS ENGINES COST LESS TO OPERATE

All Allis-Chalmers Engines have Removable Cylinder Sleeves

Valve-in-Head construction



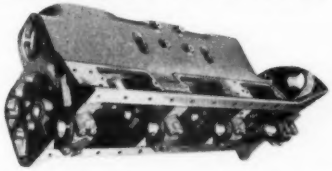
and on the larger size engines one Interchangeable



Head to each two cylinders. Permits one

man to make repairs at the location.

Heavy



Blocks keep parts in proper alignment; Pressure Lubrication to all internal moving parts. Mass Production keeps first cost and repair parts prices low. Sold and serviced by the organization, who care enough to service every engine when it is put on the job. Repair parts service available in all oil producing areas through the vast facilities of the Allis-Chalmers branches and dealers and Fred E. Cooper, Inc. branches.

COMPARE

1. Allis-Chalmers Quality
2. Allis-Chalmers First Cost
3. Allis-Chalmers Parts Cost

With those of any other engine.

FRED E. Cooper, Inc.

P. O. BOX 1890 TULSA, OKLA

Houston, Odessa, Los Angeles

Residuum Hydrogenolysis Vs. Coal Hydrogenation

(Continued from page 92)

troleum residuum and for investment in coal mining facilities for producing additional coal substituted for No. 6 fuel oil, the picture would be approximately:

1. A conventional petroleum refinery processing 30,000 bbl. per day of crude would cost about $40,000,000.

2. This leaves a remainder of $410,000,000 for petroleum residuum hydrogenolysis and for new coal mining facilities.

3. Assuming an average investment for mining eastern bituminous coal for $2,500 per daily ton, a simple calculation shows a total investment of $86,000,000 for coal mining leaving $324,000,000 for hydrogenolysis of petroleum residuum.

4. At an investment of $2,770 per daily barrel for hydrogenolysis, facilities for the hydrogenolysis of 117,000 bbl. per day of residuum could be constructed. In the case of a crude containing 10 per cent residuum, crude runs could be reduced by 168,500 bbl. per day by the hydrogenolysis of 117,000 bbl. per day of residuum with the same crude overhead production of gasoline and distillates.

5. The net decrease in crude requirements after subtracting the 30,000 bbl. per day of increased petroleum capacity amounts to 138,500 bbl. per day. A similar calculation using western bituminous coal to replace No. 6 fuel oil with investment in mining facilities of $1,100 per daily ton, shows a net saving of 161,000 bbl. per day of crude. Table 6 summarizes the over-all results.

Widespread hydrogenolysis of residuum would withdraw residual fuel oil from its present markets. These markets, especially the peacetime markets, however, have been declining steadily for a number of years in proportion to rapidly increased demands for distillate for burning oils and for the dieselization of railroads.

During a period of military emergency a very large requirement for special residual fuels of relatively low viscosity exists. The hydrogenolysis process is flexible enough to cope with this situation and even improve it. The process can be carried out under such conditions that residual fuel of a wide range of specifications may be produced at will.

With hydrogenolysis the need for using up valuable cracking stock to blend off the heavier residuum for the production of such special fuels is eliminated, since in effect the process produces its own blending stock in situ.

There are still many operations now employing residual fuel oil which could substitute coal or gas, leaving petroleum residuum available for hydrogenolysis to distillates. Additional distillate and motor-fuel stocks of 1,387,000 bbl. per day would be made available by substituting other fuels in places where residual fuel oil is now being used as shown by the rough estimate of Table 7.

In addition to the hydrogenolysis of petroleum residuum, there are quantities of high-sulfur, asphaltic crudes which could be successfully processed by this means and which at present are either not being processed at all or are being processed relatively inefficiently by conventional refinery techniques.

References

1. Report on the Petroleum and Synthetic Oil Industry of Germany, B.I.O.S. Over-all Report No. 1, p. 57.
2. The Oil and Gas Journal, September 13, 1951, p. 87.
3. Casper, J. C., The Oil and Gas Journal, January 25, 1951, p. 206.
4. Knight, E. T., The Oil and Gas Journal, January 25, 1951, p. 204.

Oil-Base Drilling Fluids . .

(Continued from page 106)

table, the following cost analysis could be made:

1. Drill entire section with rock bits	$18,050
2. Diamond core entire section with water-base mud	19,390
3. Diamond core entire section with oil-base mud	16,220
4. Drill 50 ft. first Bromide and core with water-base mud	18,016

(i) Since oil-base mud is a much better lubricating medium than clay and water, or clay, sand, and water, less friction is caused between the drilling bit and the formation, and less heat is generated. It is known that the bearings in a rock bit usually wear out before the bit cutters themselves, and thus the better the lubrication, the longer will be the life of the bit. Type "one" oil-base mud, due to its asphalt content, has a low specific heat allowing faster cooling of the bit and mud stream.

(j) Similarly, due to the better lubrication properties and the extremely thin mud cake on the sides of the hole, the torque on the drill pipe, and the drill collars is considerably less.

2. **Disadvantages** as a general-purpose drilling fluid:

(a) In some cases where earthen pits, ditches dug in the ground, and no shale-shaker screens are used, etc., special rigging up is required to make the job practical.

(b) Initially costs more than most water-base muds.

(c) Normally is a slower drilling medium in hard sands and shales with conventional drilling bits.

(d) Unless oil or gas zones are to be protected, or a special application is necessary, it is not generally economical to use oil-base mud for top-hole drilling in comparison to a good oil-in-water emulsion mud.

3. **Completions.**—Use as an oil zone or completion drilling fluid.

(a) It is an aid to coring and permits accurate core analysis.[18]

(b) Does not water block or mud off oil or gas formations.

(c) Has maximum deplastering properties (at least 96 per cent).

(d) Contains no harmful ingredients to block the producing zone should the plastering properties be allowed to decrease by inadvertent oil dilutions or lack of adequate control.

(e) It is extremely stable and easy to maintain.

(f) Has excellent plastering properties, usually forming a filter cake plus or minus 1/64-in. thickness on walls of hole, allowing liners to be run that are within ½ in. of the diameter of the drilled hole.

(g) Does not gas cut if used with proper viscosity range.

(h) Usually eliminates necessity for swabbing, scratching, or well washing to bring it on production.

(i) Reduces well-cleanup time to a minimum.

(j) Can be regenerated for use over and over again.

4. **Redrilling of wells.** — Oil-base mud is especially applicable for redrilling completion work. In cases of depleted zone drilling or when drilling through possible zones of lost circulation, the extreme light weight range possibilities (56 lb. per cu. ft. or 7½ lb. per gal.) of oil-base mud are unsurpassed.

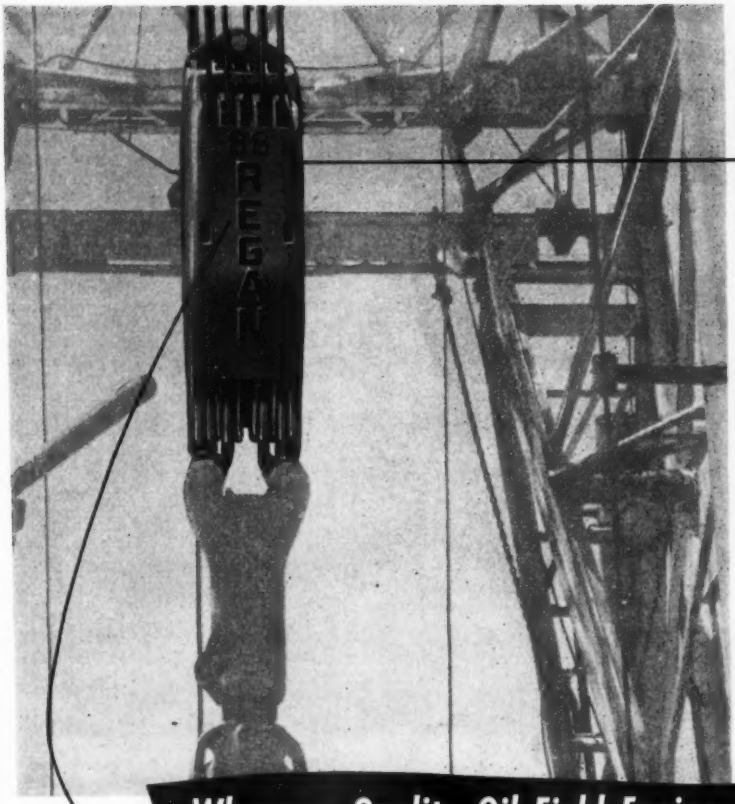
5. **Electric logging.**—At the present time the three leading commercial electric-logging companies are able to obtain excellent results in good oil-base muds. Due to the nonconductivity of this circulating medium, it is necessary to utilize either a contact electrode or the induction-log process.

6. **Counteracting earthquake damage** to casing and tubing.

In one area in California, due to earthquake conditions, operators have found that many of their wells have been destroyed due to actual bending and shear of their casing and tubing at depths ranging from 1,400 to 2,000 ft. One operator has had success in counteracting, by means of wall scraping a 30-in. bell hole from 300 to 1,000 ft. in length in the general area of this shear damage, and then filling the annulus between the casing and the bell hole with highly viscous, high-gel-strength oil-base mud. This special application acts as a "bumper" so that future earth shocks do not damage the casing.

7. **Casing corrosion inhibitor.** — In formations which are notably corrosive to casing, it is possible to pump stable oil-base mud into place between the formation and the casing.

8. **Freeing stuck drill pipe.**—In cases where drill pipe has become stuck due to thick water-base mud cakes on the sides of the hole, "balled up"



We are sure that it was much more than coincidence that prompted Unit Rig and Equipment Company to choose the REGAN 88" Traveling Block as standard equipment for their new Model U-20 Rotary Drawworks. The outstanding versatility of the U-20 unit, its portability and extremely wide range for economical drilling are the requirements that the REGAN 88" Type H Traveling Block was designed to meet. *Five* 39½-inch diameter sheaves with REGAN dual-bearings; rugged inner and outer plates for rigid bearing alignment and long wear; pressure lubrication to all sheaves; narrow, full-safety design are outstanding features—all of which make the REGAN 88" Traveling Block an outstanding part of an outstanding piece of oil field equipment.

Wherever Quality Oil Field Equipment is found—

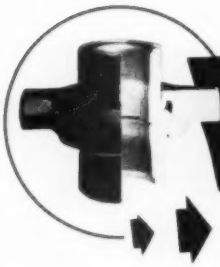
...YOU'LL FIND **Regan**

Forge & Engineering Co.

Quality – Wrought on the Forge of Experience

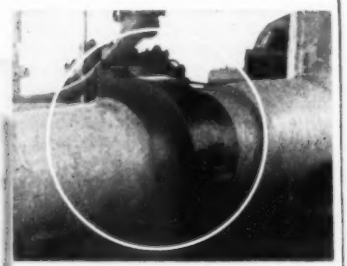
SAN PEDRO, CALIF.
BAKERSFIELD, CALIF.
Exclusive Mid Continent Representatives:
Hunt Tool Co., P. O. Box 1436, Houston, Texas

HOUSTON, TEXAS
Exclusive Export Representatives:
Hunt Export Co., 19 Rector St., New York, N. Y.
Avda Pte., R. Saenz, Pena 832, Buenos Aires, Argentina

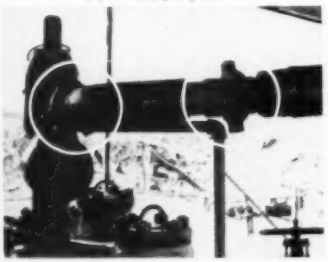


A TOUGH UNION
for Tough Service . . .
. . . . the WECO
FIG. 400

4000 p.s.i. Test
Sizes: 2", 2½", 3", 4", 5½" O.D., 6", 7" O.D., 8", 10"



The Weco Fig. 400 is ideal for pump suction connections.



Weco Fig. 400 unions save time in connecting up pump discharge lines.

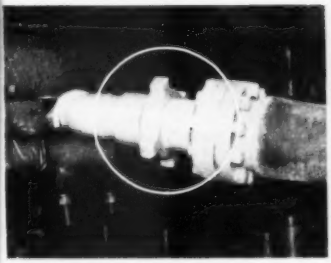
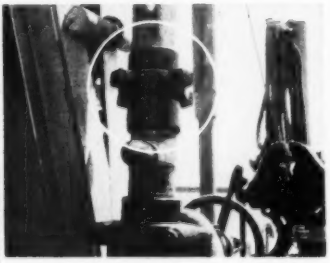


Fig. 400 Union on mud line.



4" Weco Fig. 400 Union on stand pipe.

● Unions in service on drilling rig lines get a lot of rough treatment. These mud, steam, water, oil, gas and other lines are made up and broken out frequently . . . carry fluids at high pressure with lots of vibration. The WECO Fig. 400 Union withstands more abuse in these tough services than any other union. Thicker sub end walls resist distortion . . . provide greater strength with less weight. The famous Weco ball and cone seat assures a perfect seal, every time.

SOLD EXCLUSIVELY THROUGH SUPPLY STORES

It's Wise to Standardize with . . . WECO . . .

WELL EQUIPMENT MFG. CORP.
Division of Chiksan Company
HOUSTON 1, TEXAS
Exclusive Sales Representative Outside Mid-Continent Area
CHIKSAN COMPANY
Brea, Calif. Chicago 3, Ill. Newark 2, N. J.
Export Sales: CHIKSAN EXPORT COMPANY, Brea, Calif. Newark 2, N. J.

Manufacturers and Distributors of Oilfield, Refinery, Marine and Industrial Equipment

bits, hydrous disintegrating shale formations, washouts, etc., oil-base mud (provided circulation is possible) is an excellent medium for loosening stuck drill pipe.[11]

9. **In limestone** producing formations.

In some types of limestone formations oil-base mud has been used to definite advantage to eliminate the necessity of acidizing. The reason for this type procedure is similar to normal usage in oil-sand formations—to eliminate water blocking and mudding off.

Some operators have found that in certain types of limestone formation where oil-base muds do not appear to be particularly beneficial without the aid of acidizing, it is possible to obtain a better acidizing job since the crevices or small holes in the limestone formation are not water blocked or mudded off. This allows the acid to penetrate the formation much more readily.

10. **Gravel-packing operations.**—Oil-base mud has proven beneficial in gravel-packing operations due to the fact that an almost definite size enlarged hole can be drilled. Later, when the gravel is pumped into place, the oil zone is not water blocked or mudded off.

11. **Hydrafrac** process usage.

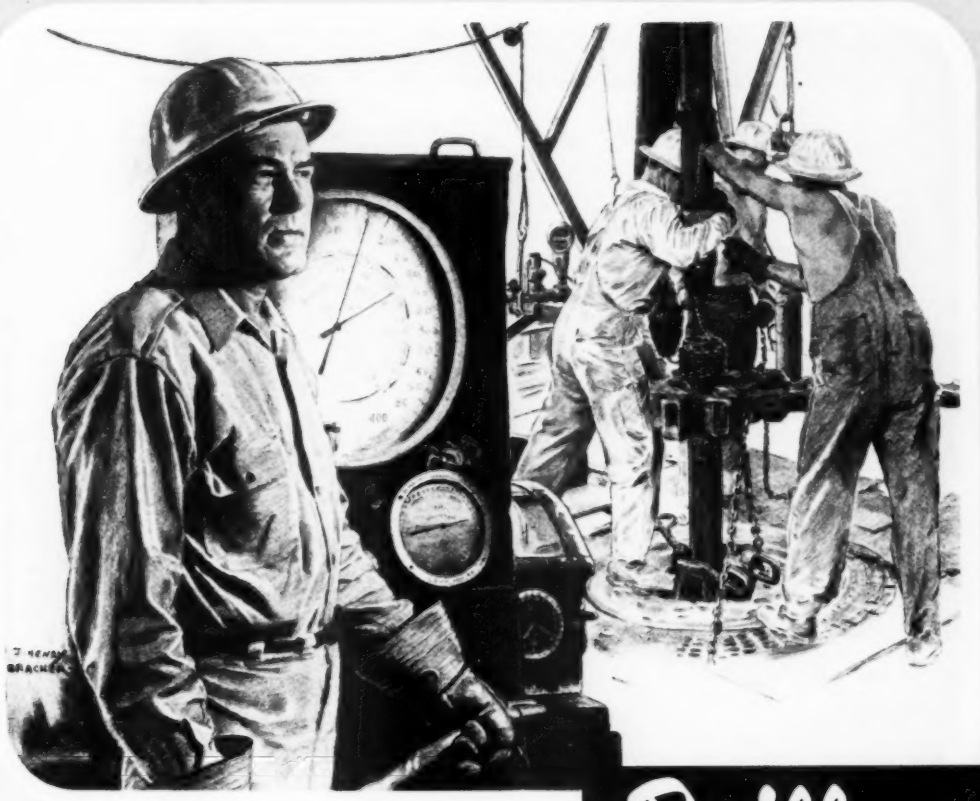
Recently a new use has been discovered for oil-base mud in conjunction with the Hydrafrac process.[12] This consists of cracking the producing formation and installing propping-agent sand grains in place to facilitate the production of extremely consolidated producing formations. The oil-base mud is used as the hole-filling medium so that after the fracturing process has been completed, water filtrate or clay water mud cake will not be allowed to destroy the beneficial results thus obtained.

Production Results, Oil-Base Mud

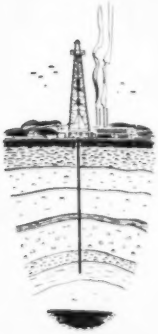
Tables 1 and 2 show actual production results obtained in various fields, from numerous records on file. These records cover cases for widely varying average permeabilities, and the productivity indices range up to 250.

References

1. U. S. Patent 2316968, Miller.
2. U. S. Patent 2223027, Dawson-Huisman.
3. U. S. Patent 2356776, Miller
4. Gates, G. L., Morris, F. C., and Caraway, W. H., U. S. Bureau of Mines, RoI 4716, p. 9, 13, August 1950.
5. Vail, J. G., Soluble Silicates in Industry, The Chemical Catalog Co., Inc., 1928.
6. U. S. Patent 2475713, Miller.
7. U. S. Patent 2316967, Miller.
8. Fisher, Gordon H., written discussion of A.I.M.E. paper, "Oil-Base Drilling Fluids," George Miller, Mar. 22, 1947.
9. Bell, H. S., "American Petroleum Refining," p. 42, 42, D. Van Nostrand Co., 1945.
10. Muskat, M., Physical Principles of Oil Production, p. 152, McGraw-Hill, 1949.
11. Miller, George, "Use of Oil-Base Mud to Free Stuck Pipe," Petroleum Engineer, June 1949.
12. Clark, J. B., "Hydrafrac Process for Increasing the Productivity of Wells," A.I.M.E. paper, October 4, 1948.



The Drilling Contractor's Driller

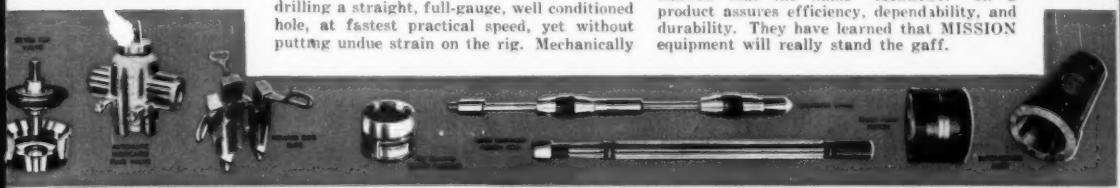


In the past ten years, the average speed of making hole has been increased about 35% — a remarkable achievement! Improved equipment has had much to do with this... but much of the credit must also go to the man who *operates* the equipment.

Drillers have been called the proudest men in the industry. They accept the complex responsibilities of actually drilling the wells. In the last analysis, it is the skill of the Driller that determines the cost per foot of hole. He is assisted by his crew of four, but he is in direct charge of operating the rig throughout his 8-hour tour, and he personally manipulates the principal mechanical controls.

Carrying out general directions from the Tool Pusher, the Driller is responsible for drilling a straight, full-gauge, well conditioned hole, at fastest practical speed, yet without putting undue strain on the rig. Mechanically minded to start with, the Driller has come to possess a sixth sense which enables him to judge by the behavior of the drill stem and the feel of the brake lever, just what is happening a mile or two miles down, at the bottom of the hole. He is responsible for maintaining correct speed of rotation, weight on the bit, pump pressure, and makes such important decisions as when bit should be changed, etc. The efficiency of the rig and crew are his responsibility.

With his fingers on the pulse of his rig 8 hours a day, no one has a greater appreciation of fine equipment than does the Driller. It is therefore significant that the Drillers of the nation and of the world have only highest praise for MISSION equipment. Through 25 years of actual experience, Drillers have learned that the name "MISSION" on a product assures efficiency, dependability, and durability. They have learned that MISSION equipment will really stand the gaff.



MISSION MANUFACTURING CO.

Mission Mfg. Co., Houston, Tex. Export 30 Rockefeller Plaza, New York. Europe: London, England

"WHAT A TRAVELING BLOCK!"

"Mon, O' Mon, Did You Say 300 TONS?"

Something New Has Been Added!

NEW
300 Tons rated capacity

NEW
Double row, pre-adjusted, Timken bearings, mounted on 8" diameter shaft.

NEW
Johns-Manville "klipper" grease seals, self adjusting, positively retain lubricant.

NEW
E-Z opening guards for quick stringing up.

NEW
42" diameter alloy steel flame hardened sheaves, 9000 streamlined pounds for fast falls and quicker round trips.

Write for catalog of this and other McKissick Products.

McKISSICK BUILDS A BETTER BLOCK FOR EVERY PURPOSE

McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

McKISSICK

A.A.P.G. DIGESTS . . .

. . . of papers presented at meeting of Rocky Mountain Section, American Association of Petroleum Geologists, at Salt Lake City, February 28-29, 1952.

Doswell Oil Field, Rio Arriba County, New Mexico

O. J. LILLY, consulting geologist, Farmington, N. M.

DOSWELL oil field lies near the geographic center of the San Juan basin, in the northern portion of T 26n, R 6w, Rio Arriba County, New Mexico, approximately 42 miles southeast of the town of Farmington. The field was discovered by the late Thomas W. Doswell and the late Todd M. Pettigrew and is now controlled by Lowry et al. Previous to the discovery, two noncommercial tests were drilled into the Morrison formation.

The discovery well, Doswell-Pettigrew 2 Scott-Federal, NW SE 9-6n-8w, was completed in July 1951. It was drilled to a total depth of 6,700 ft., through the Tocito, and completed for an initial production of 404 bbl. of oil daily, flowing through 12/64-in. choke.

Average daily production from the 2 Scott-Federal to January 1, 1952, was 390 bbl. of oil, and the Lowry et al 4-13-132 Federal, the second producer, NE NE 9-26n-6w, has averaged 186 bbl. of oil daily since completion. Cumulative oil production of the field to January 1, 1952, was 64,054 bbl.

The limits of the field have not been defined, however, 1 mile south and updip from the discovery well the Doswell-Pettigrew 1 State found the Tocito sandstone to be tight and shaly.

Doswell field probably represents a stratigraphic trap with no apparent structural uplift; however, subsequent drilling may indicate the presence of a structural trap, and sand conditions are the determining factor for oil accumulation. The producing formation, the Tocito sandstone, lentil of the Mancos formation of Upper Cretaceous age, has been correlated to the Gallup sandstone, a tongue of the lower Mesaverde formation. The Tocito sandstone of marine deposition, lenticular, and crossbedded has good development in the upper and fair development in the lower part.

Preliminary Report on the Sedimentational History of North Dakota

DONALD TOWSE, North Dakota Geological Survey, Grand Forks.

SUBSURFACE data presently available are inadequate for a detailed sedimentational analysis of the stratigraphy of North Dakota, but some preliminary interpretations are possible.

Thickness maps and facies analysis are used to interpret and to illustrate the stratigraphy. The Williston basin in North Dakota was a gently subsiding intracratonic basin during most of post-Cambrian time. Differentiation of the pre-Cambrian basement suggests pre-Huronian folding in the area later occupied by the basin.

Middle Ordovician marine shales and quartzose sandstones cover most of the state. Western North Dakota was the center of Ordovician deposition, and the sands were apparently derived from erosion of the shield area to the southeast. Continued gentle downwarp was accompanied by deposition of Upper Ordovician and Silurian carbonates. The center of Silurian deposition was to the northwest in Canada, and some Silurian sandstones were derived from erosion in the southeast. Reef structures are possible in the Silurian, and the top of the system is marked by a disconformity.

Middle Devonian through middle Mississippian rocks are largely carbonates and evaporites. A northwesterly plunging uplift, herein named the Burleigh uplift, is apparent in thickness maps of the Silurian and Devonian systems in the south-central part of the state. The uplift was the site of nondeposition and clastic deposition. The upper Devonian series is restricted to the northwestern part of the state. The upper Devonian evaporite and carbonate basin extended into Montana, and the middle Devonian extends into Manitoba and Saskatchewan.

Lower and middle Mississippian rocks cover the western three-quarters of the state and thicken toward the west and northwest. The present eastern edge is near the original shoreline, and the Charles evaporite facies is restricted to the western half of the state. The upper Mississippian-Big Snowy group and Amsden formation are largely marine clastics deposited during a westward regression of the sea. Local concentrations of shoreline sands may provide stratigraphic traps.

No Pennsylvanian or Permian rocks have been recognized in the state, and the Amsden and Big Snowy sediments are overlapped by Triassic redbeds and evaporites. Evaporites and a thick section characterize the Triassic in the west, whereas the system is thin and sandy in the east. Overlapping marine Jurassic rocks cover most of the state, with clastics and sandstones in the west and relatively more limestone and evaporites in the east.

Marine Cretaceous rocks cover most of the state, and more than 4,000 ft. was deposited in western North Dakota. Shallow Lower Cretaceous sandstones tentatively correlated with the Newcastle of the Black Hills offer interesting possibilities where they pinch out to the east and north in the central and southeastern part of the state. Nonmarine Tertiary sediments cover most of western North Dakota.

Relationship of Oil Accumulation To Paleogeology and Structure in Manitoba, Eastern North and South Dakota

WILLARD D. PYE, consulting geologist, Fargo, N. D.

THE eastern side of the Williston basin is bounded by the pre-Cambrian rocks of the Canadian Shield. These pre-Cambrian rocks gradually slope westward towards the center of the basin. Paleogeological maps show the successive eastward overlapping of the seas upon this shelf in Cambrian and Ordovician times and the successive offlapping during each period from Silurian throughout the remainder of the Paleozoic era. The Mesozoic era again saw a general increasing eastward overlap of sediments in each new period. A study of the lithology and isopach relationships indicates that the center of the basin has not always been located along its present axis and that the seas had a variety of generally westward connections.

Structures in the pre-Cambrian in Manitoba, Minnesota, North and South Dakota can be traced into the sedimentary basin and can be followed in the sediments both through structural and lithological studies. Where these structures, as well as structures originating in the sedimentary basin, cross lithological changes as shown on isopach and paleogeological maps, there is considerable promise of oil accumulation. That such accumulation may be present in certain areas is indicated in some cases by surface evidence.

Geology and Development of Bonanza Pool, Big Horn County, Wyoming

R. G. BERRY, JR., Stanolind Oil & Gas Co., Casper, Wyo.

BONANZA pool, a Tensleep sand discovery of late 1950, is located on the east flank of the Big Horn basin northeast of Worland, Wyo. The discovery well, drilled by Bonanza Oil Co., attracted considerable attention due to the high gravity of the oil at relative shallow depth and to the thick pay section. As of December 5, 1951, the pool had 20 flowing wells, which have defined an area of approximately 595 productive acres. Productive closure is 210 ft.

The structure is a northwest-southeast trending asymetric fold with a steep mountainward flank. The fact that little to no surface closure is present in Upper Cretaceous shales accounts for the late testing of this long-known surface structure. The Tensleep sand is found at depths of approximately 2,700 ft. The sand has a gross thickness of 230 ft.

Statistics on Exploration of the Four Corners Area, New Mexico, Colorado, Utah, and Arizona

PAUL H. UMBACH, consulting geologist, Albuquerque, N. M.

DURING 1951, 267 wells were drilled in the San Juan basin compared with 117 in 1950. Of those drilled in 1951, 46 were wildcats compared with 21 wildcats in 1950.

In the Paradox basin 25 wildcats were drilled in 1951 compared with 12 in 1950. In the Black Mesa basin 2 wildcats were drilled in 1951, the same number as were drilled in 1950. Of the wildcats drilled in the San Juan basin in 1951, 51 per cent were productive compared to 55 per cent in 1950. Most of the wildcats became extensions of present pools. One shallower pool test in Rio Arriba County resulted in Dogie Canyon oil field. Kutz Canyon, West Kutz Canyon, Blanco, and Ignacio gas fields have been extended. Aztec gas field has been revived and extended.

Paradox Formation

J. L. BORDEN, Pure Oil Co., Durango, Colo.

PRINCIPAL occurrence of the Paradox formation is in a northwest-southeast trending basin west of the Uncompahgre uplift, chiefly in southwest Colorado and adjacent portions of southeast Utah. It extends, roughly, from Barker dome on the Colorado-New Mexico line, northwestward to the vicinity of Green River, Utah. It is approximately 200 miles long and 115 miles wide. The town of Monticello, Utah, is near the geographical center. It is a structural basin lying between the Uncompahgre-San Juan Mountains on the east and the San Rafael-Circle Cliffs upwarps on the west. It is separated from the San Juan basin on the south by a relatively low saddle, and perhaps from the Uinta basin to the north by a similar saddle.

The Paradox formation is a depositional wedge, wthin the Hermosa formation. It is Lower Pennsylvanian in age. Similar sediments of black shale, gypsum, and anhydrite of Pennsylvanian age occur in the Eagle-Glenwood Springs area, east of the Uncompahgre uplift and on the east flank of the White River uplift. While these sediments probably are equivalent to the Paradox formation, there is no evidence to indicate that the basins were ever connected, and the term Paradox formation

has not been applied, officially, to the sediments in the Eagle basin.

Maximum thickness of the Paradox is unknown, but in one case it exceeds 10,800 ft., although this undoubtedly represents flowage rather than depositional thickness. Several wells which have drilled a normal section have had in excess of 2,000 ft. The section varies from chiefly black shale with limestone stringers along the borders of the basin to chiefly salt and anhydrite in the middle of the basin. Considerable fine micaceous sand is present, usually in thin stringers. Selenite occurs on the outcrop in large irregular nodules, usually so rough on the exterior it is not recognized. Some chert is present, also in irregular nodules. Fossils are present in the black shale section, but not in the limestones on the outcrop. Colony corals (chaetetes) have been found in a few wells.

The section is so irregular that no correlation horizons which can be used for more than local work have been established. In the salt anticlines the section is so garbled and twisted that little bedding remains, and thickness cannot be established. No exposure out in the basin exhibits the base, but in Salt Valley blocks of conglomerate, believed to have been dragged up with the salt, may represent the underlying formation.

Regional Geologic Considerations And Clear Creek Area, Utah

K. M. WILLSON, Durango, Colo.

LINES of weakness roughly parallel to the major mountain systems of the North American continent exist in modified form throughout the Rocky Mountain area. The three directions of diastrophism are closely tied to axial positions of the Wichita-Arbuckle group, the Appalachians, and the Rockies. Folds, faults, and their combinations, provide not only structural traps but affect the type of deposits which accumulate and help to localize them.

The shore of the Cretaceous sea extended northwestward from northern Mexico past Gallup, N. M., to and far beyond Provo, Utah. Near Provo there are important deposits of sand with some shale instead of the usual thin sands and thick shales. This vicinity, therefore, offers an excellent place to explore for various types of oil and gas traps.

Sands which approach the sheet type, as well as smaller lenticular bodies, were deposited near and off shore in these seas at practically all stratigraphic positions extending from Dakota time, or earlier, through Pictured Cliffs time. Therefore, oil or gas production may be expected at almost any position in the stratigraphic column of Cretaceous time when a wide geographic area is considered.

Oil and gas accumulations occur, may be expected, and will be found blanketing structure, lying on slopes in high and low structural positions, and irregularly arranged over structures and slopes.

Review of Exploratory Drilling In the Uinta Basin, Utah

VERNE E. FARMER, JR., Carter Oil Co., Vernal, Utah.

THE current era of exploratory drilling in the Uinta basin began in 1946 with Carter Oil Co. 1 Edna Davis. During the next 3 years four additional wildcat failures preceded the first discovery at Roosevelt in June 1949.

Though this initial discovery created widespread interest in the area, abnormally high operational costs and a very complex geological picture precluded any great acceleration of drilling operations. The year 1950 saw the commencement of only four new wildcat tests. In 1951 seven wildcat Tertiary tests were completed, including discoveries at Red Wash and Duchesne, for a success rate of nearly 29 per cent.

At the present time the Uinta basin has nine wildcat locations, either drilling or announced, and five pool wells in operation. Current indications offer considerable promise of additional Tertiary discoveries in the near future.

Fault Patterns in Selected Rocky Mountain Fields

D. L. BLACKSTONE, JR., University of Wyoming, Laramie.

THE position of individual folds or groups of folds within the regional structural pattern of the Wyoming foreland area is considered to be due to the response to stress of either: (1) fractures in the pre-Cambrian basement; or (2) heterogenity of the basement complex. Deformation of the overlying rocks resulted from adjustment along one of these controls acting under tangential stress.

An integral part of the development of some folds is a localized fault system known as epi-anticlinal faulting. The epi-anticlinal fault systems have been attributed to tension in the rising anticline; or to locally applied tangential stresses comparable to the action of a plunger in the immediate vicinity of the fold. An analysis of the existing fault systems in the Elk Basin and Pilot Butte folds has been made from data obtained by critical examination of electric logs. Reconstruction of the fault planes in space indicates that the idea of a tensional origin for the faults is only partially true; and that the local plunger action cannot be demonstrated.

One portion of the fault system developed as slippage between strata, and followed fractures across the bedding to propogate upward toward the surface at higher angles. Other faults apparently originated as a pair of conjugate fractures, on either or both sets of which movement became appreciable. Some of the faults are due to adjustment in the hanging wall block of an earlier fracture.

The fault systems discussed appear to be limited to Mesozoic strata, and particularly the Upper Cretaceous rocks. Folds located in the Big Horn, Wind River, and Powder River basins from which erosion has stripped the younger rocks overlying the central portion and exposed the Paleozoic rocks, have no epi-anticlinal fault systems. These folds may be bounded by a high-angle reverse fault which parallels the steep limb of the fold.

Geologic History of the Las Animas Arch, Colorado

BRUCE F. CURTIS and JOSEPH H. GOTH, JR., Continental Oil Co., Denver.

A COMPLEX anticlinal flexure about 70 miles wide extends northeastward from central Bent County into Kit Carson County, Colorado. This fold, called the Las Animas arch, appears on structural maps of post-Permian beds to be the north-plunging nose of the Sierra Grande arch of northeastern New Mexico, but pre-Pennsylvanian structural maps show that the Las Animas and Sierra Grande arches are separated by a trough which was progressively downwarped in Pennsylvanian and Permian time. The Las Animas arch developed its anticlinal structure only because of relatively greater downwarping of regions on its flanks. Sedimentary formations extend across the arch without local facies change and with only gradual, unidirectional changes of thickness.

From pre-Cambrian through Mississippian time shallow-water-type marine beds were intermittently deposited quite uniformly over the arch area. In late Mississippian time these beds were tilted eastward and slightly beveled. This was followed by downwarping south and west of the arch in the Pennsylvanian and Permian. In Triassic and Jurassic the arch and the region about it had a mildly negative structural tendency and then became part of the Cretaceous geosyncline, receiving sediments similar in thickness and type to those of surrounding regions. When the Denver basin and the Hugoton embayment were formed in late Cretaceous or Tertiary time, or both, the Las Animas arch retained its positive tendency relative to the basins.

Exploration in the Basin and Range Province

ERWIN W. CLARK, Standard Oil Co. of California, Salt Lake City.

MOST of the exploratory activities by oil companies has been confined to the major sedimentary basins located in western Utah, eastern Nevada, and southeastern Idaho. The intensive exploratory program carried on by the oil industry in this province has resulted in the acquisition of large blocks of acreage and has been the basis for the drilling of 14 new exploratory wildcats.

All of these wells, which include abandoned and current drilling wells, are located within the following four major sedimentary basins: Southern Nevada basin, eastern Nevada basin, Confusion basin, and Oquirrh basin. The results of this drilling have certainly been encouraging, and there is every indication that the past rate of exploratory activity will be continued by the major companies, minor companies, and independents in the basin and range province.

Salt-Generated Structures Of the Colorado Plateau and Possible Analogies

WILLIAM LEE STOKES, University of Utah, Salt Lake City.

SALT and gypsum-bearing sediments exceeding 10,000 ft. in thickness are known in the Jurassic of Central Utah and in the Pennsylvanian of eastern Utah and western Colorado. Similar structures, both large and small scale, appear in association with deformed salt-bearing beds in the two areas.

Evidence seems to indicate that structural evolution of the two areas followed essentially similar lines: (1) Gradual upthrust of elongate masses of plastic sediment perhaps under compressional forces or perhaps under purely geostatic pressure. (2) Stagnation or cessation of upward movement allowing uniform sedimentation across sites of former acute deformation. (3) collapse by solution with subsequent erosion forming normal faults, synclinal grabens, graben valleys, and perhaps, with local oversteepening, actual "gravity thrusts."

Caution is suggested in interpreting strong local structures of the sort found in these areas as evidence for orogenic activity.

Oil and Gas Possibilities Of the Paradox Basin

J. L. TATUM, consulting geologist, Albuquerque, N. M.

IN all developed areas most productive horizons have shows over large portions of the area. Conversely, most horizons that have shows eventually produce commercially over at least part of the area. In this region shows have been widespread through the Pennsylvanian, Mississippian, and Devonian. Ordovician has been identified at Boundary Butte and tentatively so at Horsefly with shows. Porosity has been poor, but of such nature that only slight improvement is necessary in several zones to cause these to be commercially productive. Salt anticlines were growing during Hermosa time with variations in conditions of deposition and character of beds making these features attractive for exploration. Continued exploration is confidently expected to discover oil and gas fields of importance over a vast region.

Security CASING SCRAPER

- ***FIRST*** **to operate with rotary or vertical motion while going in or coming out of the hole**
- ***FIRST*** **to cut to exact inside diameter**
- ***FIRST*** **to positively clean every inch of casing**

Cutters of Security Casing Scrapers have helical teeth for positive shearing action and are expanded to full inside diameter by spring pressure. Cutters contact entire casing circumference at all times.

Security Casing Scrapers quickly and easily remove obstructions inside casing — such as scale, gun perforation burrs, or cement sheaths resulting from cementing operations.

Operators everywhere use the Security Casing Scraper as part of their well completion programs.

GET Security IN DRILLING

ONE OF THE DRESSER INDUSTRIES

SECURITY ENGINEERING CO., INC.

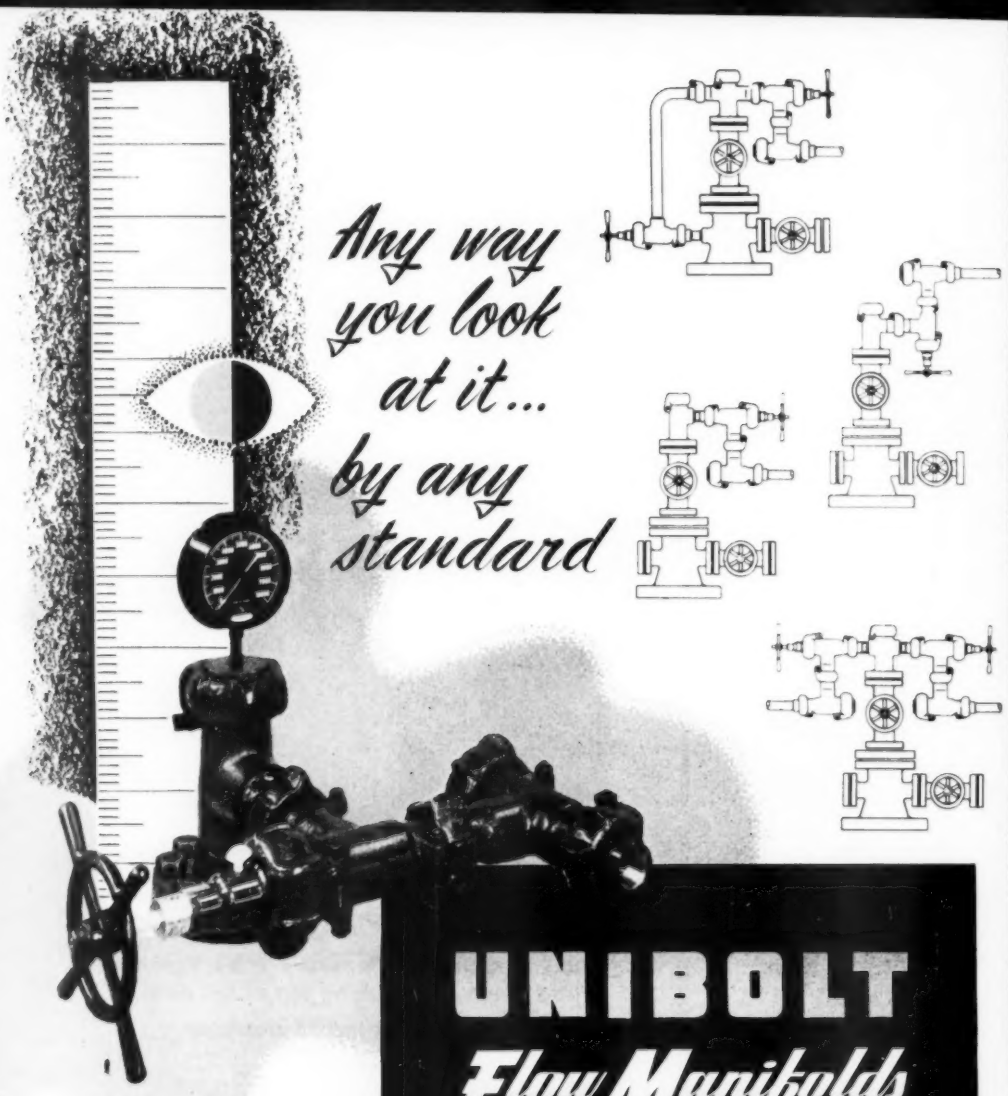
Main Office and Plant: Whittier, California

Branches in all major producing areas

Export Office: Chanin Building, New York City

ROCK BITS • REAMERS • HOLE OPENERS • CASING SCRAPERS • SECURALOY

512-5

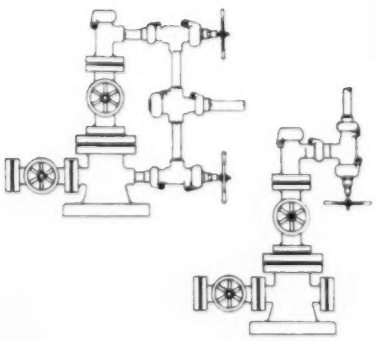


Any way you look at it... by any standard

UNIBOLT

Flow Manifolds

make your trees lighter, yet stronger and more economical



Ask your Christmas tree supplier to furnish UNIBOLT Flow Manifolds (everything above the master valve). These compact, completely salvageable manifolds, consisting of a Tee or Cross, Adjustable Wing Valve, and Positive Choke Body, are pressure-tested as a unit and may be assembled in a number of combinations to best meet individual needs.

Employing standard UNIBOLT connections rather than flanges, the UNIBOLT Flow Manifold is many pounds lighter, yet the UNIBOLT design, which places more metal in shear, actually results in a higher factor of safety for the manifold.

Furnished in regular forged steel or in high-chrome alloy for corrosive wells — 6000, 10,000 and 15,000 lbs. test.

THORNHILL-CRAVER COMPANY

P. O. BOX 1184 HOUSTON, TEXAS

UNIBOLT

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Yields in Viscosity Breaking—Part 1.

Note: There have been numerous inquiries regarding the yields that are obtainable by viscosity breaking. Inasmuch as nothing whatever is to be found in the technical literature on this subject, it was decided that it should be covered thoroughly in this and two more pages that will appear in succeeding issues of this page.

Viscosity breaking has become increasingly important in recent years because asphaltic or distilled charge stocks are required for catalytic cracking. This usefulness did not arise in connection with thermal cracking because asphaltic as well as distilled charged stocks could be cracked thermally.

Although viscosity breaking was originally developed as a means of reducing the viscosity and pour point of residual stocks and although reduction of viscosity is still significant, it was soon realized that the real measure of its usefulness was the cracked gas oil (distillate) that was produced. Upon removal of the gas oil, the viscosity of the residue of cracked fuel oil may be higher than that of the original charge stock. However, its viscosity can be reduced by dilution with light distillate or catalytic cycle stock. The matter of cracked fuel viscosity will be discussed in Part 2 of this discussion of viscosity breaking.

The cracked distillate and gasoline yields that are obtained by viscosity breaking can be computed from the ultimate gasoline yields of various charge stocks by subtracting the potential yields of gasoline that can be made from the cracked distillate that is withdrawn. Thus, according to Fig. 1 of "Yields in Noncoking Thermal Cracking" (this page, February 25, 1952, page 183) the yield of gasoline, when cracking a 20° A.P.I. residue into a 10° A.P.I. fuel oil, is about 39 per cent. If, however, a 22° A.P.I. cracked distillate is removed, the cracked distillate could be cracked for the production of 28 per cent of gasoline (also producing a 10° A.P.I. fuel oil). If the amount of distillate removed amounts to half of the original feed stock, it represents a potential yield of 0.5 times 28 or 14 per cent of gasoline. Thus, the yields during viscosity breaking are:

	Per cent
Gasoline (39-14)	= 25
Cracked distillate (22° A.P.I.)	= 50
Gas or unaccounted for*	= 2
Cracked fuel (10° A.P.I.)	= 23

*0.5 (20 — 10) — 0.5 × 0.5 (22 — 10) = 2 per cent.

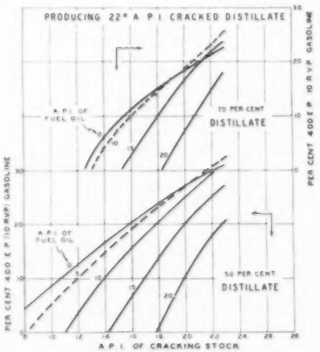

PRODUCING 22° A.P.I. CRACKED DISTILLATE
A.P.I. OF FUEL OIL
70 PER CENT DISTILLATE
A.P.I. OF FUEL OIL
50 PER CENT DISTILLATE
PER CENT 400 E.P. 10 R.V.P. GASOLINE
PER CENT 400 E.P. 10 R.V.P. GASOLINE
A.P.I. OF CRACKING STOCK

Fig. 1—Viscosity-breaking yields while producing 50 per cent and 70 per cent of 22° A.P.I. cracked distillate.

The gasoline yield of this illustration may be read from Table 1 under the 50 per cent distillate column, or from Fig. 1.

In many of the 400 cracking-plant runs that were investigated in preparing "Yields in Noncoking Thermal Cracking," cracked distillates were produced as well as gasoline and these distillate runs permitted authentication of the method of computation outlined just above. It was found that the gasoline yields (400° e.p.—10 lb. R.v.p.) obtainable from thermally cracked distillates is described by:

$$\text{Per cent gasoline} = 4 + 2(A_D - A_T)$$

in which A_D is the A.P.I. gravity of the cracked distillate and A_T is the gravity of the residual cracked fuel oil. Thus, when the 22° A.P.I. distillate of the above example is cracked, the gasoline yield is the 28 per cent shown there:

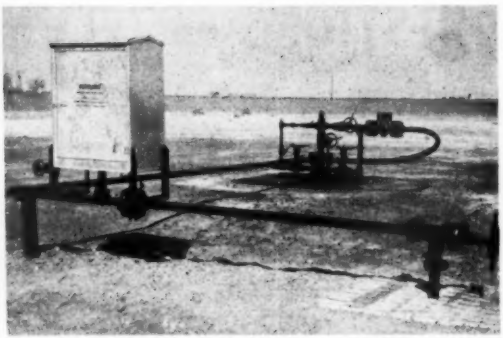
$$\text{Per cent gasoline} = 4 + 2(22 - 10) = 28$$

Tables similar to Table 1, except for the production of 18°, 26°, and 30° A.P.I. cracked distillates, will be presented in Parts 2 and 3.

TABLE 1—PERCENTAGE OF 400° E.P. (10 R.V.P.) GASOLINE BY VISCOSITY BREAKING—PRODUCING 22° A.P.I. DISTILLATE

	A.P.I. of fuel oil	Yields of gasoline for these gravities (A.P.I.) of cracking stocks															
		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Zero % distillate	0	25.8	27.4	29.0	31.6	34.2	36.8	39.4	42.0	43.8	45.6	47.4	49.2	51.0	52.4	53.8	55.2
	5	16.6	18.8	21.0	24.0	27.0	30.0	33.0	36.0	38.0	40.0	42.0	44.0	46.0	47.8	49.6	51.4
	10		4.0	9.0	12.6	16.2	19.8	23.4	27.0	29.4	31.8	34.2	36.6	39.0	41.1	43.2	45.3
	15						2.0	8.0	12.0	15.4	18.8	22.2	25.6	29.0	31.4	33.8	36.2
	20											4.0	9.0	13.0	16.5	20.0	23.5
10% distillate	0	23.4	25.8	28.2	30.0	31.8	33.6	35.4	37.2	39.0	40.8	42.6	44.4	46.2	47.6	49.0	50.4
	5	14.6	17.4	20.2	22.6	25.0	27.4	29.8	32.2	34.2	36.2	38.2	40.2	42.2	44.0	45.8	47.6
	10		4.0	8.2	11.4	14.6	17.8	21.0	24.2	26.6	29.0	31.4	33.8	36.2	38.3	40.4	42.5
	15						1.0	6.0	10.2	13.6	17.0	20.4	23.8	27.2	29.6	32.0	34.4
	20											3.0	8.0	12.2	15.7	19.2	22.7
30% distillate	0	13.8	16.2	18.6	20.4	22.2	24.0	25.8	27.6	29.4	31.2	33.0	34.8	36.6	38.0	39.4	40.8
	5	7.0	9.8	12.6	15.0	17.4	19.8	22.2	24.6	26.6	28.6	30.6	32.6	34.6	36.4	38.2	40.0
	10			2.6	5.8	9.0	12.2	15.4	18.6	21.0	23.4	25.3	28.2	30.6	32.7	34.8	36.9
	15							2.6	6.6	10.0	13.4	16.8	20.2	23.6	26.0	28.4	30.8
	20											1.0	6.0	10.6	14.1	17.6	21.1
50% distillate	0	4.2	6.6	9.0	10.8	12.6	14.4	16.2	18.0	19.8	21.6	23.4	25.2	27.0	28.4	29.8	31.2
	5		2.0	5.0	7.4	9.8	12.2	14.6	17.0	19.0	21.0	23.0	25.0	27.0	28.8	30.6	32.4
	10				0.2	3.4	6.6	9.8	13.0	15.4	17.8	20.2	22.6	25.0	27.1	29.2	31.3
	15								3.0	6.4	9.8	13.2	16.6	20.0	22.4	24.8	27.2
	20												4.0	9.0	12.5	16.0	19.5
70% distillate	0						2.0	6.0	9.0	10.8	13.0	14.2	16.6	18.4	19.5	21.0	23.2
	5							5.0	8.4	10.3	12.7	14.0	16.6	18.4	19.8	22.0	24.8
	10							4.0	7.4	9.8	12.2	13.8	16.6	18.4	20.0	23.0	25.7
	15									2.8	6.2	9.6	13.0	16.4	18.8	21.2	23.6
	20												3.0	7.4	10.9	14.4	17.9

Injection gas pressure boosted to 1,500 psi.



One of 12 input wells in the unit.

Another Unitization-Secondary Recovery Project . . .

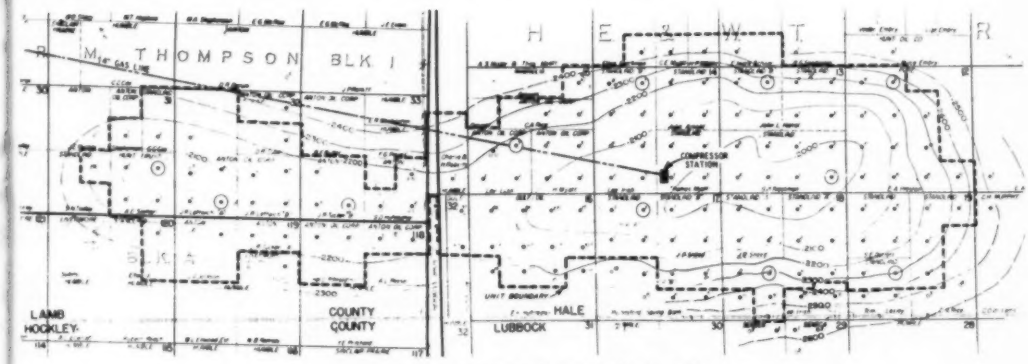


Fig. 1—Contour map of Anton-Irish field.

Anton-Irish Field Starts Gas Injection

Unit operated by Stanolind Oil & Gas Co. Allowable is 100 bbl. per day as against 42 bbl. per day before start of program

GAS-INJECTION operations in Anton-Irish field, 30 miles northwest of Lubbock, Tex., were started in January. This marks the inaugural of another unitization and secondary-recovery project designed to increase the ultimate recovery of crude oil.

The first gas injection at Anton-Irish, on January 16, 1952, climaxed prolonged efforts to provide a suitable conservation program for the field. Negotiations were begun more than 3 years ago and were completed last May. Final approval by the Texas Railroad Commission came on June 22, 1951, and the Anton-Irish unit became effective on July 1. Stanolind Oil & Gas Co. is the unit operator.

The allowable per well in the field was 42 bbl. a day before the start of the injection program. Effective February 1, 1952, however, the Railroad Commission approved an allowable of 100 bbl. per well per day, in recognition of the fact that the conservation project had been completed and placed in operation.

Additional Gas From El Paso Natural

The oil contains only a small amount of gas in solution (solution gas-oil ratio is 148 cu. ft. per bbl.). Consequently, to carry out the initial phases of the injection program, it is necessary to purchase gas from outside sources. The gas is obtained from El Paso Natural Gas Co. A line to carry the gas to the field, a field compressor station, and gas-distribution system were completed by the operators prior to the start of actual injection operations.

Fig. 1 is a contour map of the field which also shows the boundaries of the unit, the location of the compressor station, and the approximate route of the gas line from El Paso's main line.

Lying approximately at the intersection of Hockley, Lamb, Hale, and Lubbock counties, Anton-Irish field originally was thought to be two separate pools. The west dome, or Anton portion of the field, was discovered in December 1944, with the completion of Humble Oil & Refining Co. 1 J. A. Jackson. This well was subsequently acquired by Anton Oil Corp.

The east dome, or Irish part of

Anton-Irish pool, was brought in by Stanolind with its 1 Lee Irish "A," in April 1946. Subsequent development showed that the two fields were actually part of the same reservoir, and the Railroad Commission designated them as one—Anton-Irish.

The structure is an elongated anticline with local closure on the eastern and western portions. Production is from the Clearfork dolomite at an average depth of 5,900 ft., and the general spacing pattern is 1 well to each 40 acres.

After discovery of the east dome of the field in 1944, development was rapid through 1949. By mid-1948, bottom-hole-sample analyses, produced gas-oil ratios, and reservoir-pressure behavior had shown that the oil in the reservoir had only a small amount of gas in solution. Since fluid expansion and dissolved gas were the principal sources of energy, it became apparent that recovery efficiency would be relatively low unless some type of secondary-recovery project were inaugurated.

Engineering Studies

Preliminary engineering studies showed that the field was well suited to a dispersed-type gas-injection program. Such a program was agreed upon, even though it was apparent that it would entail buying gas for injection from a source outside the field. Produced solution gas is barely enough to meet fuel and lease requirements, and is not sufficient for injection at the desired rate.

Engineering studies showed that the field should be unitized in order to conduct most efficiently the dispersed-type gas-injection program. In the latter part of 1948, a preliminary engineering prospectus dealing with unitization and gas injection was distributed to the working interest owners in the field, and a meeting was called to discuss the proposed program.

The operators were enthusiastic about the possibilities of the proposed program. There followed a series of operators' meetings and engineering and geological committee studies, which culminated in the operators reaching agreement on unitization and gas injection late in 1950.

During the following 6 months, the proposed program was presented to the royalty owners in the field in order to obtain their approval of unitization to permit gas injection on a field-wide basis. In general, they were very receptive to the program, since it would be conducted at no cost to them, and would result in increased benefits to them—as well as to the operators—as the result of conservation and increased oil recovery.

At the time of the public hearing on May 31, 1951, held to present the unitization and injection program to the Texas Railroad Commission for approval, 87 per cent of the 232 royalty owners in the field, owning 75 per cent of the total royalty interest, had signed the unitization agreement. The commission subsequently approved the unitization and gas injection program on June 22, 1951, permitting the Anton-Irish Clearfork Unit to become effective July 1, 1951. The unit includes 6,110 acres and 136 of the 144 wells completed at the time of unitization. Fig. 1 also shows development, the unit boundaries, and the probable initial gas input wells.

Injection Makeup Gas

Makeup gas for the injection program, purchased from El Paso Natural Gas Co., is sweet, dry gas available at a pressure of 650 to 700 psig. For injection purposes, the pressure is increased to 1,500 psig. at the compressor plant in the field. The plant has an initial capacity of 2,000 M.c.f. per day, while the distribution system for the injection gas is sized for 20,000 M.c.f. daily. Initially, there will be 12 input wells in the field. The compressor is a 300-hp. unit, of the skid-mounted type.

Injecting gas into the reservoir will slow down the natural decline of the reservoir pressure, which was 2,021 psia. initially. This will result in maintaining the producing capacity of the wells at a higher barrels per day rate than would be possible if gas were not injected. The injected gas also will serve in much the same way as gas evolved from solution, in that it will supply energy for moving additional oil to the well bores.

While it will be necessary initially to purchase an appreciable amount of makeup gas for injection, later in the life of the project it will be possible to obtain most of the gas needed for injection by collecting produced casing-head gas. The future injection program, which will be controlled by an operators' committee, may eventually include as many as 30 input wells, and injection volumes up to 20 million cubic feet per day. However, the program will be flexible, and necessary changes will be based upon future reservoir performance, in order that the most efficient recovery will result.

The characteristics of the crude from Anton-Irish are similar to those of oil produced from Cedar Lake field in Gaines County, Texas, where gas-injection operations have been successfully conducted for several years. Accordingly, operators are confident of comparable results at Anton-Irish. A substantial amount of additional oil is expected to be recovered at Anton-Irish as the result of the program.

Stanolind will operate the unit for the working interest owners, who include, besides Stanolind: Anton Oil Corp.; A and H Oil Co.; Gulf Oil Corp.; Hunt Oil Co.; Carolyn Hunt Trust, Estate; Magnolia Petroleum Co., and Pure Oil Co.

ROLO WELLCHECKERS

PERMANENT AND PORTABLE SEPARATORS FOR METERING OIL AND GAS

Field installation of trailer-mounted Rolo Wellchecker No. 1H-2406

Made in various sizes to fit any operation, Rolo Wellcheckers are shipped completely piped and ready to operate. You need only connect inlet and outlet. In addition to oil meter, B. S. & W. sampler, gas run, orifice meter, fittings and all controls, free water knockout with meter can be furnished to separate and continuously remove free water from well fluid. See Composite Catalog or write for illustrated Bulletin 1951-W.

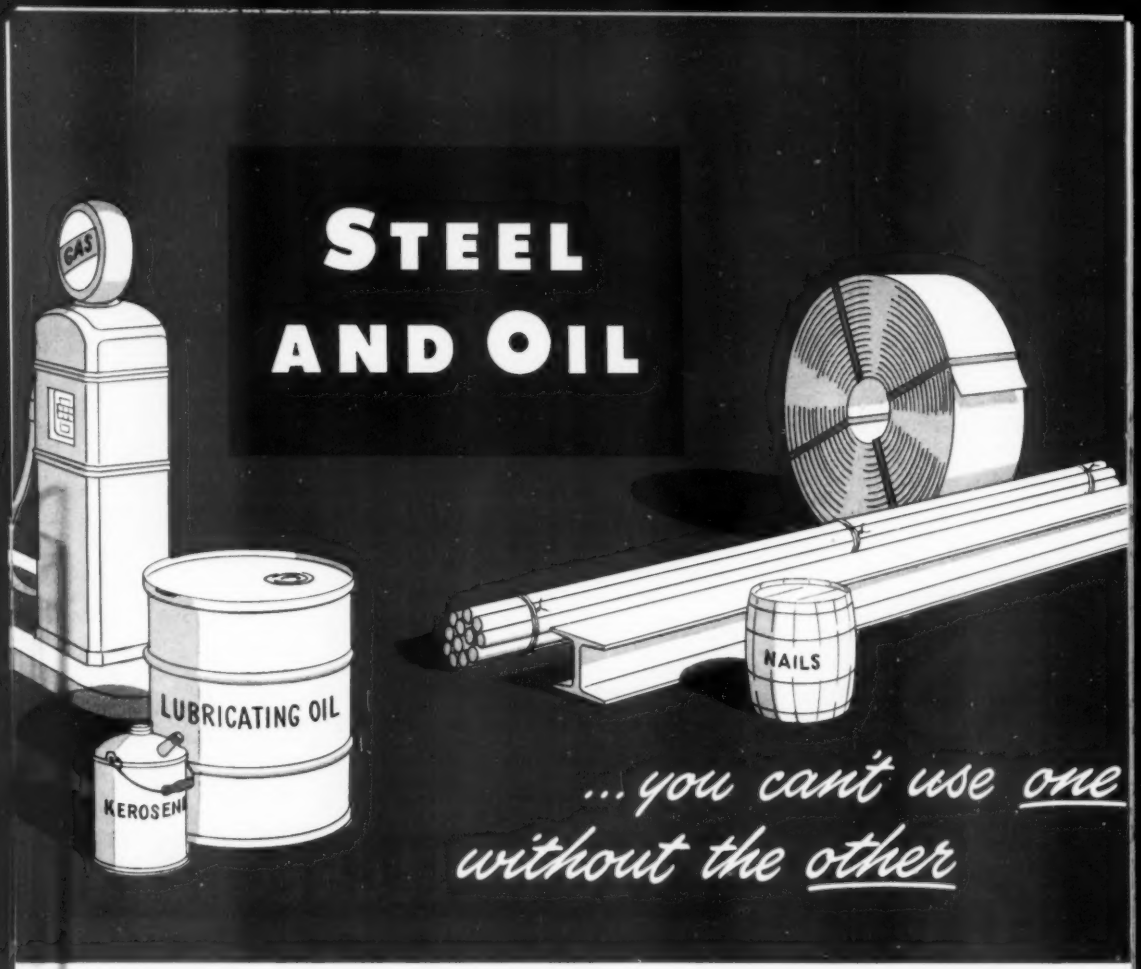
Crude Oil Metering Specialists

ROLO MANUFACTURING COMPANY

2510 South Blvd., Houston 6, Texas

BRANCHES: Corpus Christi, Midland, Kilgore, Tulsa, New Orleans, Los Angeles, Casper, Calgary (Alta.)

EXPORT OFFICE: R. S. Stokvis & Sons, Inc., 17 Battery Place, New York, N. Y.



McKee builds the plants that produce them

IT'S virtually impossible to find a place where steel is used without the use of some petroleum product in its production, fabrication or operation. It is just as hard to name a use for gasoline or oil without steel in the picture.

Steel and Oil—these are industry's "inseparables" and they are needed today in greater quantities than ever before.

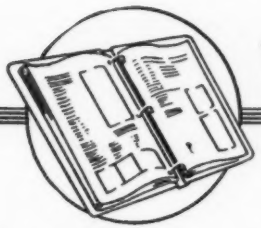
The McKee organization has designed and built hundreds of plants in the United States and some 25 foreign countries and is now engineering new facilities which will account for a definite increase in the production of iron and steel and petroleum products.

DESIGN, ENGINEERING AND CONSTRUCTION FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES

McKee Engineering

Arthur G. McKee & Company • Established 1905

Headquarters: McKee Building, 2300 Chester Avenue, Cleveland 1, Ohio. *New York Office:* 30 Rockefeller Plaza, New York 20, N.Y. • *Washington Office:* 1507 M Street, N. W. Washington, D. C. • *England:* The Iron and Steel Division of Arthur G. McKee & Company is represented by Head, Wrightson & Company, Ltd. *District Engineering Offices:* Union, New Jersey and Tulsa, Oklahoma



THE REFINER'S notebook

No. 113

Back-Pressure Relief Valves

by S. Chesler* and B. W. Jesser†

IN the design of relief-valve system the decision must be made as to whether the discharge shall vent directly to the atmosphere or to a closed system terminating in a flare or a water-quenched stack. If the decision is in favor of the open system, a minimum of additional work is required. However, if a closed system is selected, a considerable number of problems must be solved in order to attain a safe and satisfactory system. In most cases a rather expensive system is involved with long, large lines meandering all over the refinery. Complete detailed design of such systems will not be covered here.

Three ways of approaching the problem of relief-valve system design are:

1. A method applied to closed systems involves the application of a special type of safety-relief valve which has been under development in order to eliminate or reduce the effects of back pressure and thus reduce line sizes in the discharge system. Experimental valve capacity data observed by the authors are included.

2. The second method presents a procedure whereby, if a closed system is used, the sizes of the discharge piping may be reduced by setting the pop pressure of the conventional safety-relief valve below the design pressure of the vessel.

3. The third method assists in making the decision of open system versus closed system. It involves the use of diffusion equations in order to determine the maximum concentration of a gas that might be expected at grade when a given quantity of gas is discharged from a safety-relief valve into the atmosphere. The location of this point of maximum concentration may also be determined.

Some definitions were given in the preceding number of Refiner's Notebook. Additional definitions that may be of aid in following this series are:

Opening pressure: The pressure at which there is a measurable opening of the disk.

Accumulative pressure: The maximum relieving pressure permitted by governing code.

Reseat pressure: The pressure at which the valve closes automatically after discharge.

Blowdown: The difference between opening and reseat pressure.

Lapse rate: The rate of decrease at atmospheric temperature with altitude.

Inversion: A meteorological condition wherein the atmospheric temperature increases with altitude.

One approach to the problem of reducing discharge line size involves the use of a special type of relief valve so designed that the effect of back pressure on the operation of the valve is essentially eliminated. For convenience and due to the lack of any better generic name for this special type of relief valve, such valves will be referred to in this series as "back pressure" relief valves as contrasted with the "conventional" relief valve.

In the development of a good back-pressure relief valve there are four main conditions that must be achieved. They are as follows:

1. With a superimposed back pressure at the valve outlet the valve should pop when the contents of the vessel reach the set pressure.

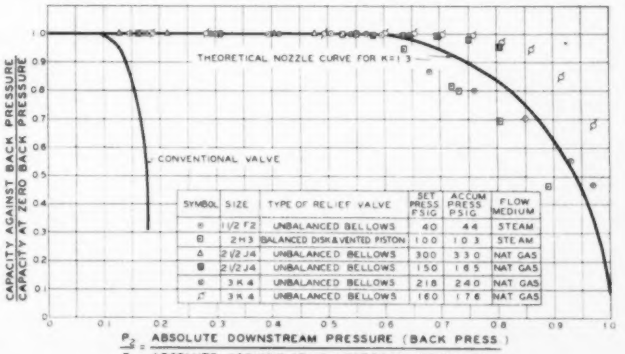
2. After the valve pops and the vessel reaches the accumulative pressure, the valve should attain its full lift and its rated capacity against back pressure. The rated capacity should be maintained until the back pressure reaches critical and then with further increase in back pressure the capacity should fall off gradually, approximating as closely as possible the theoretical nozzle capacity for the noncritical region.

3. With superimposed back pressure, there should be little or no tendency for the relief valve to open at pressures in the vessel below set pressure.

4. The blowdown should not be excessive even with superimposed back pressure at the relief valve outlet at the time of closing.

However desirable the achievement of the above conditions may be, it should be remembered that extreme back-pressure conditions can only occur when practically the entire refinery is upset and, therefore, variations in the set pressure and blowdown somewhat broader than normally permitted are tolerable. Capacity, however, should very definitely be established over the entire range of contemplated use of the relief valve.

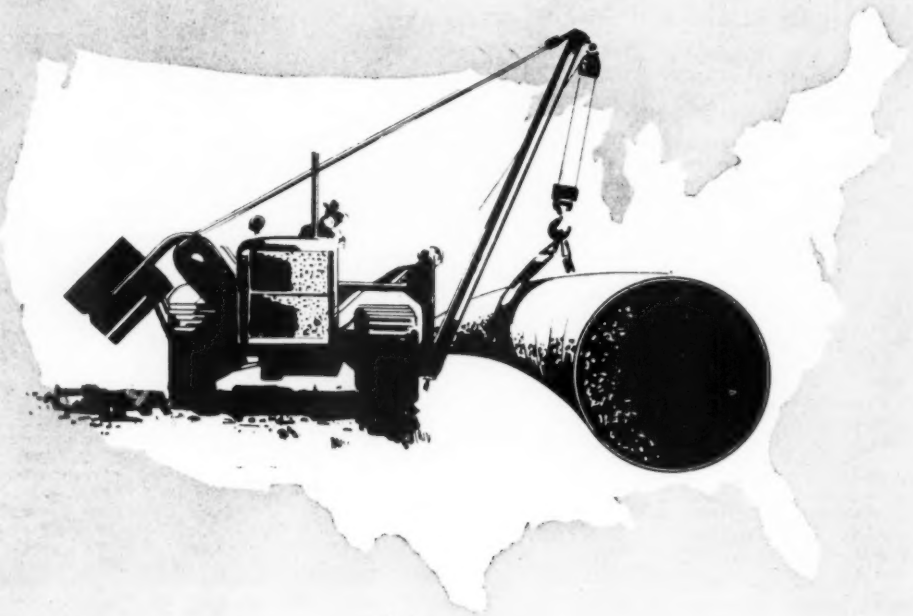
The potentialities involved in the use of a good back-pressure valve are best illustrated by reference to the accompanying figure.


CAPACITY AGAINST BACK PRESSURE / CAPACITY AT ZERO BACK PRESSURE
THEORETICAL NOZZLE CURVE FOR K=1.3
CONVENTIONAL VALVE
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
$\frac{P_2}{P_1}$ = ABSOLUTE DOWNSTREAM PRESSURE (BACK PRESS.) / ABSOLUTE ACCUMULATIVE UPSTREAM PRESSURE

SYMBOL	SIZE	TYPE OF RELIEF VALVE	SET PRESS PSIG	ACCUM PRESS PSIG	FLOW MEDIUM
⊕	1½ F2	UNBALANCED BELLOWS	40	44	STEAM
⊡	2 H3	BALANCED DISK & VENTED PISTON	100	103	STEAM
△	2½ J4	UNBALANCED BELLOWS	300	330	NAT GAS
⊠	2½ J4	UNBALANCED BELLOWS	150	165	NAT GAS
⊙	3 K4	UNBALANCED BELLOWS	218	240	NAT GAS
⊿	3 K4	UNBALANCED BELLOWS	160	176	NAT GAS

*Piping engineer, and ahead of the piping analytical section, M. W. Kellogg Co. Portion of paper presented at Toronto meeting of A.S.M.E.

OUT WHERE THE GOING'S TOUGH



OIL LINES
RIVER CROSSINGS
PRODUCTS PIPELINES
GAS PIPELINE CONSTRUCTION

R. H. Fulton & COMPANY

CONTRACTORS

PHONE 5231 LUBBOCK, TEXAS P.O. BOX 1526

Pipe-Line Construction

FOLLOWING is a tabulation of pipeline projects which are planned or under construction. Included are crude-oil, products, and natural-gas lines. This list is compiled from surveys made by The Oil and Gas Journal.

Crude-Oil Pipe Lines

Cities Service Pipe Line Co.—64 miles, 18-in., proposed, Sour Lake, Tex., to Lake Charles, La.

Continental Pipe Line Co.—105 miles, 8-in., authorized, Rincon to northwest of Sullivan City on to Port Isabel, Tex. Completion date 1952.

217 miles, 12-in., authorized, Wichita Falls, Tex., to Ponca City, Okla. Completion date 1952.

Gulf Refining Co.—80 miles, 24-in., proposed, Midland to Colorado City, Tex.

Humble Pipe Line Co.—4, 6, 8, 12-in., proposed, Upton and Reagan counties, Texas.

Interstate Oil Pipe Line Co.—33 miles, 20-in., authorized, Bunkie to Melville, La. Completion date 10-52.

68 miles, 16-in., authorized, Raceland to Anchorage, La. Completion date 10-52.

18 miles, 12-in., authorized, LaRose to Raceland, La. Completion date 10-52.

47 miles, 16-in., authorized, Sunset to Anchorage, La. Completion date 7-52.

Mid-Continent Pipe Line Co.—23 miles, 4-2-in., under way, Elmore City to Velma, Okla. C. P. Carter Const. Co. Gus Bowman, spreadman at Duncan, Okla. Completion date 3-1-52.

Ohio Oil Co.—117 miles, 22-in., under way, Sheridan, Ind., to Lima, Ohio. R. A. Conyes, contractor.

Pan American Pipe Line Co.—27 miles, 26-in., Genoa to Texas City, Tex. Completion date 12-52.

40 miles, 14-in., Arden Station in Irion County to Eldorado Station in Schleicher County, Texas. 6-52.

Platte Pipe Line Co.—1,075 miles, 16, 20-in., under way, Worland, Wyo., to Wood River, Ill. Completion date 1952.

573 miles, 16, 20-in., under way, Winchester, Wyo., to Brule, Neb. R. H. Fulton & Co. (Sections 1, 2, 3, and 4.—Section 1, 126 miles of 16-in., remainder 20-in.). A. A. Carrigan, spreadman at Wheatland, Wyo., field office.

142 miles, 20-in., contracted, near Marysville, Kans., to Holdredge, Neb. Bishop & Lock (Section 5). H. LaQuey, spreadman.

100 miles, 20-in., contracted, northern edge of Kansas. Rumsey Bros., contractor of Section 6.

Section 7. 274 miles, 20-in., Missouri River to Salisbury, Mo., and Section 8, Salisbury to Mississippi River, under way. O. R. Burden Construction Co. field office, Mexico, Mo.; B. C. Hall, spreadman; river crossing field office, Hartford, Ill., Dick Jernigan, spreadman.

Progress Pacific Pipe Line Co.—900 miles, 20-in., proposed, Permian basin, West Texas to California.

Rancho Pipe Line System.—455 miles, 24-in., authorized, McCamey to Houston, Tex. Completion date late 1952. (Joint project with Sinclair Pipe Line Co., Pan American Pipe Line Co., Tidewater Pipe Line Co., Nantucket Pipe Line Co., Phillips Pipe Line Co., and Ashland Pipe Line Co. with Shell Pipe Line Corp. handling construction and operation.

267 miles, contracted, McCamey to Cedar Valley near Austin, Tex. Anderson Bros. Corp.

188 miles, contracted, Austin to Houston. Houston Contracting Co.

Roosevelt Oil & Refining Corp.—22 miles, 4 and 6-in., authorized, St. Helens to Norwich, Mich.

Service Pipe Line Co.—28 miles, 20-in., looping, authorized; Drumright, Okla., to Humboldt, Kans. G. G. Griffis Const. Co., contractor. E. G. Grisham, spreadman at Drumright.

30 miles, 10-in., proposed, Lea County, New Mexico.

30 miles, 6-in., Knox and Haskell counties, Texas.

29 miles, 4, 6, 8-in., proposed, Natrona County, Wyoming.

Shell Pipe Line Co.—42 miles, 8-in., authorized, Hallettsville to La Grange, Tex. Completion date 7-1-52.

66 miles, 8-in., authorized, Gohlke to La Grange, Tex. Company crews. Completion date 1952.

Sinclair Pipe Line Co.—674 miles, 22, 24-in., under way, Drumright, Okla., to East Chicago, Ind. Completion date 1952.

Section 1—150 miles, 24-in., under way, Drumright-Cushing, Okla., area, to Humboldt, Kans. O. R. Burden Construction Co.

(Spread 1) 60 miles, 24-in., under way, Caney to Humboldt, Kans. A. B. Haynes, supt., at Chanute, Kans.

(Spread 2) 90 miles, 24-in., under way, Cushing, Okla., to Caney, Kans. Floyd Lewis spreadman at Hominy, Okla.

Skelly Oil Co.—38 miles, 8-in., under way, Lyons to Burrton, Kans. Rumsey Bros., contractor. Completion date 1-52.

Sterling Pipe Line System.—53 miles, 12-in., authorized, Sterling, Colo., to connection with Platte Pipe Line at Gurley, Neb. (includes 20 miles, 10-in., main line; 35 miles, 6-in., branch lines.) Joint venture comprising Toronto Pipe Line Co., Shell Pipe Line Corp., and Texas Pipe Line Co.

Sun Pipe Line Co.—99 miles, 4, 6, 8-in., proposed, Scurry County, Tex.

Texas Pipe Line Co.—319 miles, 22, 12, 10-in., Louisiana Gulf Coast to Port Arthur, Tex., including 220 miles, 22-in., Houma, La., to Port Arthur, Tex.; 31 miles, 12¾-in., Houma to Cocodrie, La. Houston Contracting Corp. Completion date in summer 1952.

175 miles, 16-in., under way, Corsicana to East Houston. Smith Contracting Corp. Completion early summer.

319 miles, 22, 12, 10-in., under way, Louisiana Gulf Coast to Port Arthur, Tex. Houston Contracting Co.

220 miles, 22-in., under way, Houma, La., to Port Arthur, Tex. Houston Contracting Co.

67 miles, 22-in., under way, Holmwood, La., west to Port Arthur, Tex. Houston Contracting Co., E. C. Norris, superintendent at Lake Charles, La.

67 miles, 22-in., under way, Holmwood east to Gueydan, La., and from Morgan City east to Houma. Houston Contracting. W. H. Hayes, superintendent, at Jennings, La.

86 miles, 22-in., under way, Gueydan east to Morgan City, La. Houston Contracting. F. A. Silar, superintendent, at Abbeville, La.

65 miles, 6, 8, 10-in., under way, and 30 miles, 12-in., Houma, La., south through Terrebonne Bay vicinity. Houston Contracting. H. L. Leake, superintendent, at Houma.

West Texas Gulf Pipe Line Co.—471 miles, 26-in., contracted, Colorado City to Wortham, Tex., Wortham to Sour Lake, Tex., 24-in. Completion date 10-52.

114 miles, 20-in., contracted, Wortham to Longview, Tex. Completion date 10-52.

44 miles, 26-in., under way, Glenrose, Tex., area. Anderson Brothers, contractor.

Products Pipe Lines

Bell Oil & Gas Co.—150 miles, 6-in., planned, Ardmore to Drumright, Okla. (Includes 114 miles, 8-in., 32 miles, 6-in.)

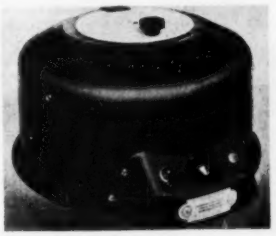
Buckeye Pipe Line Co.—370 miles, 8, 12, 16-in., authorized, Linden, N. J., via Allentown, Pa., to Auburn, Syracuse, Waterloo, and Rochester, N. Y. (Sections divided as follows: 75 miles, 16-in., 218 miles, 12-in., 77 miles, 8-in.). Start 1952, completion of 16-in., 1952, balance 1953.

Coastal Products Pipe Line Co.—260 miles, 20-in., proposed, Houston to Baton Rouge.

Ohio Oil Co.—255 miles, 8, 10-in., pro-

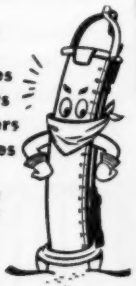
NEW

NEW WALKER CENTRIFUGE MACHINE



A more unique, compact, six-volt centrifuge machine has been developed by W. L. Walker Company for use by the field gauger. Measures accurately the BS and water content of crude oil. The new Walker Centrifuge now features a combined rheostat and switch with safety pilot light. Speeds are adjustable up to 2450 RPM (required ASTM speed—1750 RPM). Six volts and five and one-half amps make it easy on the car battery. Simple to install in the gauger's car, the centrifuge now occupies less space. Being constructed of aluminum castings makes it light, non-sparking, rugged. The tube head is numbered to aid ready identification of samples. A direct drive to the tube head eliminates unnecessary bearings which before were subject to dirt. The elimination of these bearings reduces maintenance to a minimum. The control panel is simple to use and easy to see.

- Walker Tulsa Oil Thief
- Gauging Tapes
- Strapping Kits
- Sample Heaters
- Carrying Cases

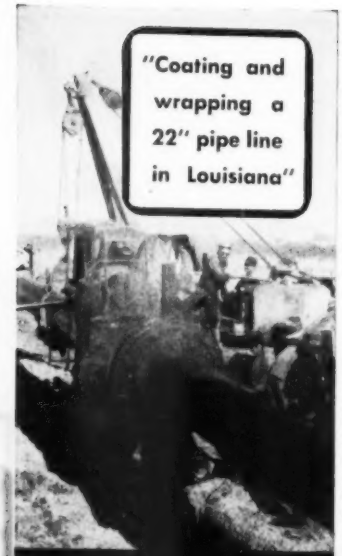


Everything the Gauger Needs from One Dependable Source!

QUALITY WLW SERVICE

W. L. WALKER COMPANY

Ph. 2-1148
1009 S. Main
TULSA, OKLAHOMA



HOUSTON CONTRACTING COMPANY
General Contractors
OIL • GAS • GASOLINE • WATER PIPE LINES
LAURENCE H. FAVROT R. P. GREGORY GEO. A. PETERKIN
2707 FERNDALE PLACE HOUSTON 6, TEXAS

GENERAL
PIPE LINE
CONTRACTORS
Personal Supervision on Construction of Your
Pipe Lines • Water Lines
Sewer Lines • Excavations
Salt Water Disposals
TROJAN
CONSTRUCTION CO.
INCORPORATED
1416½ N. ROBINSON
OKLA. CITY, OKLA. PH. 2-7696
WAREHOUSE PHONE 6-1430

posed, East St. Louis, Ill., to Indianapolis.

24 miles, 8-in., authorized, East St. Louis to Wood River, Ill.

Phillips Oil Co.—28 miles, 12-in., authorized, Sweeny to Freeport, Tex. Completion date 3-52.

Phillips Pipe Line Co.—42 miles, 10-in., under way, Green Ridge to Villa Ridge, Mo. Mid-States Const. Co. T. H. Edmonds, superintendent at Sedalia, Mo.

34 miles, 8-in., under way, Kankakee, Ill., to Dyer, Ind. Somerville Const. Co. O. P. Hiner, spreadman at Kankakee. Completion date 3-15-52.

68 miles, 12¾-in., under way, Osawatomie westward to Wichita, Kans. Brown Lite Co. R. E. Carriker, spreadman at Osawatomie, Kans.

40 miles, 10-in., through Monteau, Cole, Osage, and Gasconade counties, Missouri, Trojan Const. Co. E. L. Maggard, spreadman at Linn, Mo.

Under way, Paloa, Kans.-Harrisonville, Mo. Smith Contracting Corp.

74 miles, 8-in., under way, looping from Decatur, Ill., to East Chicago, Ind. Somerville Const. Co., contractor.

137 miles, 10-in., authorized, looping from Paola, Kans., to East St. Louis, Ill.

Pioneer Pipe Line Co.—(Continental Pipe Line Co. and Sinclair Pipe Line Co.). 310 miles, 8-in., proposed, Sinclair, Wyo., to Salt Lake City, Utah.

Progress Pacific Pipe Line Co.—900 miles, 10-in., proposed, California to West Texas.

Salt Lake Pipe Line Co.—Proposed, Pasco, Wash., to Puget Sound.

Shell Oil Co.—565 miles, 8-14-in., planned, Wood River via East Chicago to Detroit; 35 miles, 14-in. Completion date summer of 1952.

Sinclair Pipe Line Co.—10-in., Houston to Baton Rouge; 16-in., Kalamazoo to Detroit; 20-in., Marcus Hook to Bayonne, N. J.; East Chicago to South Bend, Ind.

Socony-Vacuum Oil Co., Inc.—175 miles, 6-8-in., under way, Augusta, Kans., to Kansas City, Mo. Ray L. Smith & Son, Inc. (Spreadmen are located as follows: Dewey Whitworth at Topeka, Kans.; Carl Samuel Colvin at Burlingame, Kans.; George Kelpar at Topeka, Kans.; Clark Liggett, Tonganoxie, Kans.).

Standard Oil Co. (Ind.).—316 miles, 12-in., proposed, Sugar Creek refinery to Dubuque, Iowa.

122 miles, 8-in., under way, Neodesha, Kans., to Belton, Mo. Bills & Troth Construction Co., Carl Bills, superintendent, at Armory Building, Neodesha. Completion date 1952.

Standard Oil Co. (Ohio).—17 miles, 6-in., authorized, Toledo to West Toledo, Ohio.

Susquehanna Pipe Line Co.—123 miles, 6, 8-in., proposed, Fostoria to Randolph, Ohio.

United States Pipe Line Co.—1,000 miles, proposed, Gulf Coast via Memphis, Nashville, Tenn., Lexington, and Paducah, Ky., to Cincinnati, Ohio.

Natural-Gas Pipe Lines

Allied Gas Co.—24 miles, 6⅜-in., proposed, McLean to Champaign County, Illinois.

Associated Natural Gas Co.—88 miles, authorized, Missouri.

Carolina Natural Gas Corp.—185 miles, 2-12-in., proposed, lateral lines off Transcontinental in North and South Carolina.

Cities Service Gas Co.—179 miles, 4-30-in., gathering system in vicinity of Ulysses, Kans. Vaughn & Taylor Const. Co., Inc. D. D. Vaughn, spreadman, Ulysses.

21 miles, 26-in., proposed, Franklin and Anderson counties, Kansas.

15 miles, 20-in., Craig County, Oklahoma, to Lawrence County, Missouri.

Coast Counties Gas & Electric Co.—40 miles, 3, 4, and 8-in., planned. Coast and Valley region, California.

Colorado Interstate Gas Co.—250 miles, 20-in., under way, Kit Carson, Colo., to Amarillo, Tex. R. H. Fulton & Co., contractor. Jerry Nash, spreadman at Lamar, Colo.

16 miles, 4-in., Pueblo County to Fowler, Colo.

Commonwealth Natural Gas Corp.—537 miles, 20-in., proposed, West Bend, Ky., to Norfolk, Va.

Cumberland & Allegheny Gas Co.—46 miles, 10-in., authorized, Mountain Lake Park, Md., to Preston County, West Virginia.

Dow Chemical Co.—70 miles, various sizes, Midland, Saginaw, and Bay City, Mich. Mahoney Contracting Co., contractor. Ralph Bucher, spreadman at Midland.

East Tennessee Natural Gas Co.—172 miles, 22-in., authorized, Greenbrier to Oak Ridge, Tenn.

100 miles, 16-in., proposed, Knoxville to Kingsport, Tenn.

El Paso Natural Gas Co.—133 miles, 30-in., proposed, looping along main line in Texas, New Mexico, Arizona.

36 miles, 24-in., proposed, looping from Kingman to Franconia, Ariz.

Equitable Gas Co.—17 miles, 16-in., under way, near Pittsburgh, H. L. Gentry Const. Co., contractor. Lavern Curtis, spreadman at Sewickley, Pa.

Georgia Gas Co.—32 miles, 4½-in., proposed, Bogart to Gainesville, Ga.

Glacier Gas Co.—285 miles, 20-in., proposed, Kalispell, Mont., to Spokane, Wash.

120 miles, 16-in., proposed, Spokane to Hanford, Wash.

91 miles, 8⅝-in., proposed, Spokane to Lewiston, Idaho.

130 miles, 12¾-in., proposed, Spokane to International boundary at Trail, British Columbia.

Grand Valley Pipe Line Co.—105 miles, 8-10-in., planned, Piceance Creek field to Rifle on to Grand Junction, Colo.

Gulf Michigan Transmission Corp.—650 miles, 30-in., proposed, Perryville, La., across Arkansas, Missouri, and Illinois, to terminus near St. John, Ind.

Home Gas Co.—32 miles, proposed, Chemung and Broome counties, New York.

17 miles, 12-in., proposed, loops from Hancock to Sanford, N. Y.

Iowa-Illinois Gas & Electric Co.—41 miles, 10-in., authorized, Washington County to Cedar Rapids, Iowa.

¾ to 6-in., under way, Davenport, Iowa, and Moline, Ill. C. E. Wilson Const. Co.

Kansas-Nebraska Natural Gas Co., Inc.—179 miles, proposed, Kansas and Nebraska.

40 miles, 6-in., under way, Albion to Norfolk, Neb. Jayhawk Const. Co., Inc., contractor; F. A. Faler, spreadman at Albion.

30 miles, 6-in., under way, Albion to Neligh, Neb. Jayhawk Const. Co., Inc. F. A. Faler, spreadman at Albion.

60 miles, 8, 10, 12-in., under way, Grand Island to Albion, Neb.

65 miles, 2-8-in., authorized, Big Springs field to Ogallala, Neb., and to Ovid, Colo.

39 miles, 4 and 6-in., planned, Neligh to O'Neill, Neb. 54 miles, 4 and 6-in., planned, Neligh to Hartington, Neb. (extension). Completion date 1952.

Kansas Power & Light Co.—27 miles, 20-in., authorized, Pratt, Kans., to Calista compressor station.

Lake Shore Pipe Line Co.—45 miles, 10¾-in., authorized, northwesterly from T.G.T. system near Meadville, Pa., to Ashtabula, Ohio.

Lone Star Gas Co.—100 miles, proposed, storage fields to the Dallas-Fort Worth area.

Manufacturers Gas Light & Heat Co.—40 miles, proposed, Allegheny, Washington, and Beaver counties, Pennsylvania.

Michigan Gas Storage Co.—93 miles, 16, 22, 24-in., under way, Laingsburg to near Pontiac and Mount Clemens, Mich. (Includes 17 miles of lateral lines.) Mahoney Contractor. Completion date 6-52.

30 miles, 26-in., authorized, looping between Laingsburg and Mount Pleasant Junction, Mich.

Michigan Gas Utilities Co.—77 miles, under way, Sturgis, Hillsdale, and Coldwater, Mich. (22.7 miles, Marshall south to Coldwater; 20 miles, Coldwater easterly to Hillsdale; 22.5 miles, Hillsdale to Sturgis, 11 miles, Hillsdale to Jonesville.) Somerville Const., contractor. Jim Godwin at Coldwater.

MidSouth Gas Co.—240 miles, proposed, Greene, Poinsett, Crittenden, St. Francis, Lee, Phillips, Monroe, Woodruff, and Cross counties, Arkansas.

Mississippi River Fuel Corp.—98 miles, 16- and 18-in., authorized, feeder line from Lincoln Parish, Louisiana, to Waskom field, Harrison County, Texas.

40 miles, 18-in., authorized, Dubach to Perryville, La.

Missouri Central Gas Co.—25 miles, 6-in., contracted, Moberly to Macon, Mo. L. R. Young Const. Co.

Montana Power Co.—52 miles, 16-in., authorized, Canada-Montana border to Cut Bank, Mont.

National Utilities Co. of Michigan.—76.7 miles, 20-in., proposed, South Central Michigan. (22 miles from near Marshall south to Coldwater; 20 miles east to Hillsdale; 22 miles southwest to Sturgis; 5 miles from Hillsdale to Jonesville and 8 miles west to Union City.)

Nevada Natural Gas Pipe Line Co.—114 miles, 10-in., proposed, Topock, Ariz., to Las Vegas, Nev.

New River Gas Co.—50 miles, planned, Summers to Monroe counties, West Virginia to Narrows and Dublin, W. Va.

New York State Natural Gas Corp.—66 miles, 20-in., proposed, looping on Westmoreland, Armstrong, and Tioga counties, Pennsylvania. (Includes 17 miles, 16-in., in Potter County, Pennsylvania, and 21 miles 14-in., replacement in Line No. 507, New York.)

New York Natural Gas Co.—21 miles, Columbiana and Stark counties, Ohio.

Niagara Mohawk Power Corp.—55 miles, 10-in., Fulton to Watertown, N. Y.; Williams-Austin Co., contractor, Howard Bauer, supt. Completion date 9-52.

Northeastern Gas Transmission Co.—221 miles, 20-24-in., authorized, New Hampshire, Massachusetts, and Connecticut.

Northeastern Gas Co.—411 miles, proposed, New England towns.

Northern Natural Gas Co.—580 miles, proposed, Kansas, Texas, Oklahoma, and Nebraska loops.

370 miles, 4-26-in., authorized, gathering lines in Hugoton field.

210 miles, 26-in., proposed, five loops in Texas-Oklahoma area, two in Kansas, and two in Nebraska.

181 miles, 4-12-in., contracted, gathering system in Hugoton area. Reese Bros. Const., contractor. Completion date in spring.

Northern Indiana Fuel & Light Co.—33 miles, 8-in., proposed, Edgerton to Auburn, Ind.

Northwest Natural Gas Co.—750 miles, planned, Washington, Oregon, and Idaho.

373 miles, 24-in., proposed, Eastport, Idaho, to Monroe, Wash.

79 miles, 18-in., proposed, Monroe to International boundary near Lynden, Wash.

29 miles, 22-in., proposed, Monroe to near Seattle, Wash.

164 miles, 20-in., proposed, Seattle to Portland, Ore.

Ohio Fuel Gas Co.—31 miles, 20-in., proposed, Licking County to Richland County, Ohio.

25 miles, 20-in., under way, Xenia, Ohio Sheehan Pipe Line Const. Co. Earl Williams, spreadman at Xenia.

22 miles, 16-in., authorized, Dayton, Troy, Piqua, and Sidney, Ohio.

23 miles, 16-20-in., authorized, Wellington to Elyria, Ohio; 16 miles, 20-in., authorized, Benton Station to Crawford Station. 18 miles, 20-in., Crawford Station to near Columbus. 16 miles, 16-in., authorized, Berlin to Sandusky, Ohio.

74 miles, 3 to 20-in., authorized, Hocking, Knox, and Ashland counties, Ohio.

47 miles, 20-in., authorized, Benton Township, Hocking County, to Columbus, Ohio.

61 miles, authorized, northern and southwestern Ohio.

Oklahoma Natural Gas Co.—14 miles, 8⅝-in., under way, Shamrock to Cushing, Okla.; 21 miles, 24-in., under way, Depew to Kellyville, Okla. 9 miles, 12¾-in., Stroud to Depew, Okla. 26 miles, 12-in., under way, Ringwood to Enid, Okla. Completion date 3-15-52.

Pacific Gas & Electric Co.—44 miles, 8-in. under way, Salinas to King City, Calif. W. A. Tyler, contractor. Completion date 1952.

141 miles, 34-in., proposed, parallel sections along Topock-Milpitas line.

10 miles, 10-12-in., authorized, Monterey to Fort Ord to Castroville; 12 miles, 16-in., Napa Wye to Shellville; 6 miles, 12-in., Cotati to Santa Rosa, Calif.

Pacific Northwest Pipeline Corp.—Alberta fields through to Pincher Creek, Spokane, Hanford, Vancouver, and Portland.

Panhandle Eastern Pipe Line Co.—70 miles, 24-26-in., under way, looping from Sneed, Tex., to Emporia, Kans.

174 miles, 30 and 26-in., contracted. Tuscola, Ill., eastward—looping present system; R. A. Conyes, contractor. 44 miles, 26-in., Edgerton, Mich.; Anderson Bros.; 22 miles, 30-in., looping in Tuscola, Ill.; 45 miles, 30-in., looping in Montezuma, Ind.; 63 miles, 30-in., looping in Zionsville, Ind.

Pennsylvanian Gas Co.—52 miles, 12-in., between Warren and Erie, Pa. Section 1—27 miles, under way and contracted by Harford Bros. Section 2—25 miles.

Peoples Natural Gas Co.—25 miles, proposed, Cambria and Blair counties, Pennsylvania.

Phillips Petroleum Co.—118 miles, 3-22-in., under way, Sherman and Hansford counties, Texas, gas-gathering system; Vaughn & Taylor Construction Co., Inc., Dumas, Tex., J. F. Crawford, spreadman at Texhoma, Okla.

Prairie Pipe Lines, Ltd.—Windsor, Ont., to Montreal, Que., Canada.

Prince George's Gas Corp.—20 miles, 22-in., authorized, between Chillum and Rockville, Md.

Public Service Co. of Colorado.—95 miles, proposed, Douglas Creek and other gas fields to Grand Junction, Colo., area.

Public Service Co. of North Carolina.—33 miles, 10-in., authorized, Burlington to Chapel Hill, N. C., completion date 3-1-52; 16 miles, 8-in., authorized, Chapel Hill to Raleigh, N. C., completion date 7-1-52; 29 miles, 4-in., authorized, Statesville to Kanapolis, N. C., completion date 7-1-52; 83 miles, 8-in., authorized, Kings Mountain to Asheville, N. C., completion date 3-1-53.

Rockland Light & Power Co.—22 miles, 8-in., proposed, Orangetown to Tompkins Cove, N. Y.

Southern California Gas Co.—35 miles, planned, Antelope Valley, California.

Southern California Gas Co. and Southern Counties Gas Co. of California.—45 miles, 30 in., proposed, looping on line from Arizona border to Los Angeles.

81 miles, 30-in., proposed, Whitewater to Desert Center, Calif.

Southern Natural Gas Co.—21 miles, 24-in., authorized, Perryville Station La., to Boeuf River.

14 miles, 24-in., authorized, Onward Station, Miss., to Big Sunflower River.

14 miles, 14-in., authorized, Perryville Station, La., to Wilhite Gate.

375 miles, 24-in., planned, Gwinville, Miss., to Atlanta, Ga.

169 miles, proposed loops, Ouachita Parish, Louisiana, to Augusta, Ga.; 20 miles in Ouachita Parish, 33 miles in Ouachita and West Carroll parishes; 7 miles, Sharkey County, Mississippi; and 108 miles, 14-in., Bass Junction to Augusta, Ga.

Southern Union Gas Co.—21 miles, 20-in., authorized, Albuquerque, N. M.

27 miles, 10-in., authorized, Lea and Eddy counties, New Mexico.

30 miles, 12-20-in., contracted, San Juan County, New Mexico. R. H. Fulton & Co.

Southwest Gas Corp., Ltd.—26 miles, proposed, from P.G.&E. line to Victorville, Calif.

Sunray Oil Corp.—133 miles, 3-30-in., under way, system for Snyder gasoline plant. Vaughn & Taylor Construction Co., contractor. D. D. Vaughn, spreadman.

Tennessee Gas Transmission Co.—591 miles, 24-30-in., proposed, looping along present system (consisting of 323 miles of 30-in.; 167 miles of 26-in.; 101 miles of 24-in.)

420 miles, 30-in., Texas, Louisiana, Arkansas, Mississippi, Tennessee, and Kentucky.

101 miles, 26-in., Kentucky and Ohio.

304 miles, 24-in., proposed, Mercer, Pa., to Utica, N. Y.

250 miles, miscellaneous laterals.

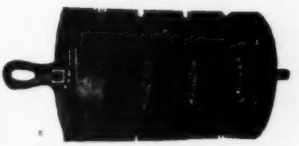
Texas Eastern Transmission Corp.—791 miles, 30-in., under way, Kosciusko, Miss., to Connellsville, Pa.

Section 1 and 2, 163 miles, 30-in., under way, Kosciusko, Miss., to Florence, Ala. Williams Bros.-Davis Co.

Section 3, 76 miles, 30-in., Florence, Ala., to Columbia, Tenn. Eastern Pipe Line Contractors.

Section 4, 73 miles, 30-in., under way,

MOLE
Pipeline
Cleaner



for BETTER cleaning of

CRUDE LINES

PRODUCT LINES

NATURAL GAS LINES

FOR DETAILS WRITE

Pipeline Cleaners Co.

Fort Madison, Iowa

S. E. HUEY & CO.
ENGINEERS & SURVEYORS
OUACHITA BANK BLDG.
MONROE, LA.

SURVEYING & MAPPING

PIPE LINE SURVEYS

TO CHANGE YOUR ADDRESS

IT'S BEST . . .
to send your old address clipped from the Journal mailing envelope along with your new location.

ADVANCE NOTICE . . .
10 days before you move, and we guarantee you week-to-week undelayed service.

WRITE . . .

Circulation Department

THE OIL AND GAS JOURNAL
Box 1260 Tulsa 1, Okla.

Columbia, Tenn., to Cumberland River. H. B. Zachry Co. A. Vaughn, superintendent at Lebanon, Tenn.

Section 5, 79 miles, 30-in., under way, Cumberland River to Columbia, Ky. Oman Const. Co. William Smith, superintendent and Floyd Hudnell, spreadman at Columbia, Ky.

Section 6, 82 miles, 30-in., under way, Columbia, Ky., to Boonesboro, Ky. N. A. Saigh Co.

Section 7, 100 miles, 30-in., under way, Kentucky River to Ohio River, northeastern Kentucky. Mahoney Const. Co.

Section 8, 77 miles, 30-in., under way, Portsmouth to Amesville, Ohio. Anderson Bros. Corp.

Section 9, 74 miles, 30-in., under way, Amesville to Ohio-West Virginia river crossing. Anderson Bros. Corp.

Section 10, 66 miles, 30-in., under way, Ohio River to Connellsville, Pa. Anderson Bros Corp.

50 miles, 30-in., under way, Ohio River to Vanceburg, Ky. Trojan Construction Co., Inc., contractor. Charles Tillotson, spreadman at Morehead, Ky.

Texas Gas Transmission Corp.—408 miles, 26-in., proposed, looping from Bastrop to Hardinsburg, Ky.

223 miles, 26-in., proposed, Bastrop, La., to Covington, Tenn.

47 miles, 26-in., proposed, northeastward from Covington.

49 miles, 26-in., proposed, northeastward from Kenton, Tenn.

45 miles, 26-in., proposed, northeastward from Calvert City, Ky.

25 miles, 26-in. proposed, northeastward from Slaughters, Ky.

19 miles, 26-in., proposed, southwestward from Jeffersontown, Ky.

35 miles, 12-in., authorized, Slaughters, Ky., to Evansville, Ind.

180 miles, 26-in., authorized, Acadia Parish to connection with existing facilities in Morehouse Parish.

195 miles, 26-in., proposed, Gulf Coast region to southwestern Louisiana.

560 miles, 26-in., proposed, Louisiana and Kentucky.

Texas-Ohio Gas Co.—1,350 miles, 30-in., authorized, Hidalgo County, Texas, through Arkansas, Mississippi, Tennessee, and Kentucky on to Spencer, W. Va. Completion date 6-30-53.

Union Oil Co. of California.—40 miles, 8-10-in., planned, San Joaquin Valley and Los Angeles basin.

United Fuel Gas Co.—32 miles, 20-in., under way, Lanham to Broad Run, W. Va. H. L. Gentry Construction Co., contractor. Frank Morris, spreadman at Charleston, W. Va.

United Gas Pipe Line Corp.—315 miles, 24-30-in., under way, Agua Dulce to near Goodrich, Tex. Oklahoma Contracting Co., contractor. Panama Shiflett, spreadman, El Campo, Tex.; Ray Law, spreadman, Victoria, Tex.

510 miles, 20 to 30-in., under way, Agua Dulce, Tex., to Monroe, La. River Const. Corp., contractor.

Spread 1, 51 miles, 30-in., from Pearl River north and south of Jackson, Miss. Red Tatom, superintendent at Jackson.

Spread 2, 45 miles, 30-in., McComb to Pearl River south of Jackson. Merle Tatom, superintendent at Hazelhurst.

Spread 3, 30 miles, 30-in., Kosciusko south toward Jackson. Jimmy Reed, superintendent at Kosciusko.

Spread 4, 29 miles, 12-in., Lafayette to Jeanerette, La. Roy Earnhart, spreadman at Jeanerette.

Spread 6 and 7, 97 miles, 20-24-26-in., under way, Houston to Dupont's Sabine River Works, Orange, Tex. Barney Hall, superintendent at Port Arthur.

Spread 6, 20 miles, 20-in., under way, Orange to Port Neches, Tex. (This spread to move on to Trinity River and work toward Houston.) Banty Traweek, spreadman.

Spread 7, 20-26-in., under way, Port Neches to Fannett, Tex. (This spread will continue on to Trinity River.) Borger Red McMenamy, spreadman.

124 miles, Sterlington compressor station, near Monroe to Jackson, Miss.

23 miles, 8-12-16-in., South Louisiana facilities.

53 miles, 24-in., authorized, Texas.

50 miles, 16-in., authorized, Baldwin County, Alabama, southeasterly to Escambia County, Florida.

36 miles, proposed, offshore from Ingleside to near Refugio, Tex.

All contracted by River Const. Corp., a joint venture including Oklahoma Contracting Co.; J. Ray McDermott & Co., Inc., and Morrison-Knudson. Inspection by Brown & Root, Inc.

Utah Natural Gas Co.—360 miles, 22-in., proposed, San Juan basin area to Salt Lake, Utah.

Virginia Natural Gas Co.—153 miles, Buckingham to Richmond and Portsmouth, Va.

Western Kentucky Gas Co.—2 to 4-in., under way, additions to present system; Modern Welding Co., Inc., contractor.

Western Pipe Lines.—1,200 miles, 22-in., planned, southern Alberta to Duluth, Minn.

West Texas Gas Co.—27 miles, 10-in., authorized, Lubbock to Abernathy, Tex.

Foreign Crude-Oil Pipe Lines—Planned and Under Way

Alberta-Vancouver Oil Pipe Line Co.—(Brokaw, Dixon, McKee).—972 miles, 16-in., proposed, Edmonton via Pincher Creek, Alta., Idaho and Washington states to Vancouver, B. C.

Cia. de Petroleo Ganso Azul, Ltd.—48 miles, 4-in., planned, Ganso Azul field to Pucalpa on upper Ucayali River, Peru.

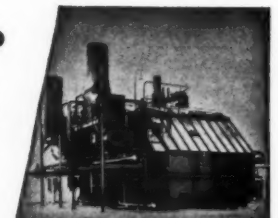
Condor.—90 miles, 12-in., under way, Genoa to Rho, near Milan, Italy. Soc. Ital. Condotte Acqua Montubi, contractor. Completion date 7-31-52.

Creole Petroleum Corp.—143 miles, 26-in., authorized, Ule (State of Zulia) to Amuay (State of Falcon). Completion date March 1953.

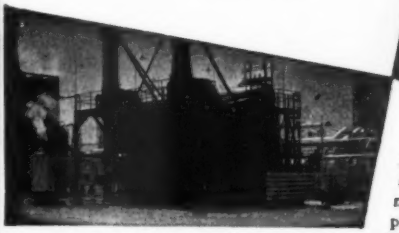
25 miles, 34-in., authorized, Lagunillas to La Salina (State of Zulia). Completion date April 1953.

WICKES

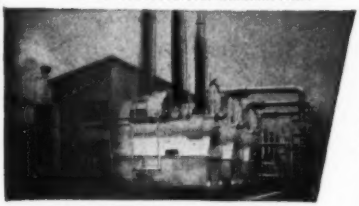
STEAM GENERATORS SPEED PROCESSING AND CUT COSTS IN REFINERIES AND NATURAL GASOLINE PLANTS



West Texas Natural Gasoline Plant



Central Texas Natural Gasoline Plant



Louisiana Refinery

Indiana Installation

The Wickes Type A Steam Generator is proving itself one of the most serviceable boiler units employed by the oil and gas industry. Wickes can fill your exact requirements for boilers of any type up to 250,000 lbs. steam per hour and 850 p.s.i. Wickes service facilities are world-wide and our knowledge of steam generation is available to you without obligation. Write for descriptive literature on the famous Wickes line of steam generators.

WICKES

THE WICKES BOILER CO. Saginaw, Mich.
Division of THE WICKES CORPORATION
RECOGNIZED QUALITY SINCE 1854

SALES OFFICES: Atlanta • Boston • Chicago • Cincinnati • Denver • Detroit • Houston • Indianapolis • Los Angeles • Milwaukee • New York City • Pittsburgh • Saginaw • San Francisco • San Jose • Springfield • Seattle • St. Louis • Tulsa • Mexico City • Buenos Aires • Manila • Havana • Montevideo • San Juan, P.R. • Victoria, B.C.

134

Direccion General de Yacimientos Petroliferos Fiscales.—409 miles, under way, Plaza Huincul to Bahia Blanca, Argentina.

Iraq Government.—135 miles, 12-in., proposed, from Iraq Petroleum Co. at Baija to Baghdad, Iraq. Construction 1952, M. W. Kellogg, contractor.

Iraq Petroleum Co., Ltd.—556 miles, 30-32-in., under way, Kirkuk, Iraq, to Banias, Syria, 1952; Bechtel-Kirkuk, contractor.

72 miles, 12¾-in., Zubair to Fao. Arabian Bechtel Co., contractor.

Kuwait Oil Co., Ltd.—10 miles, 20-in., authorized, third transit line Burgan-Ahmadi. Completion date 2-52. 6 miles, 30-in., authorized, sixth gravity loading line, Ahmadi-Mina al Ahmadi. Completion date 6-52. 5 miles, 16-20-in., authorized, Burgan field —oil collecting line. 2-52.

Middle East Pipelines, Ltd.—800 miles, 34-35-in., planned, Iran to a Levantine port.

Petroleos Mexicanos.—145 miles, 12-in., considered, 18 de Marzo field via Reynosa to Monterrey, Mexico.

100 miles, planned, Isthmus of Tehuantepec, Jose Colomo to El Plan field, Minatitlan.

Shell Caribbean Petroleum Co.—160 miles, 30-in., under way, Palmajero to terminals on the Paraguana Peninsula (Cardon and Las Piedras, Venezuela), 4-52. Land sections contracted by Williams Brothers, de Venezuela, S.A., Charles P. Williams, manager, Marvin E. Jones, superintendent. Water crossings contracted by Mahoney Contracting Co.

Texas Petroleum Co.—60 miles, 4-6-in., under way, Pto. Nino to La Dorada.

Trans-Mountain Oil Pipe Line Co.—715 miles, proposed, Edmonton, Alta., to Vancouver, B. C. Canadian Bechtel, Ltd., engineers.

Foreign Products Pipe Lines—Planned and Under Way

Colombia Ministry of Petroleum.—90 miles, 6-in., planned, Puerto Berrio to La Dorada, Colombia.

113 miles, 6-in., contracted, Puerto Berrio to Acededo near Medellin, Colombia. Carolina Construction Co.

75 miles, 4-in., planned, Buena Ventura to Cali, Colombia.

Empresa de Ferrocarriles Ecuatorianos.—50 miles, 6-in., contracted, Guayaquil to Palmira, Ecuador. J. A. Jones, contractor; C.R.C. Engineering Co., engineers.

Estrada de Ferro Santos a Jundiai.—32 miles, 18-in., under way, Santos to Sao Paulo, Brazil ((fuel oil line); Techint, contractor. Completion date 12-51.

Governments of Southern Rhodesia and Portuguese East Africa.—200 miles, considered, Beria, Portuguese Mozambique to Umtali, Southern Rhodesia.

Imperial Oil Co., Ltd.—230 miles, 10-12-in., under way, Sarnia via London, Hamilton to Toronto, Ont., Canada. Comstock-Midwestern, Ltd., contractor. Completion date July 1952.

Petrocogno (Sub. Cie. Financiere Belge des Petroles, S.A.).—225 miles, considered, Ango-Ango to Leopoldville, Belgian Congo.

Petroleos Mexicanos.—155 miles, 10-in., under way, Minatitlan to Salina Cruz, Mexico.

Societe des Transports Petroliers par Pipe Line.—140 miles, 10-in., under way, Le Havre to Paris, Fance. Entrepose, contractor. Completion date 1952.

State of Cundinamarca, Colombia.—120 miles, 6-in., Puerto Salgar to Bogota, Colombia; Williams Brothers Co.: David Louthen, manager, Bogota.

Trans-Northern Pipe Line Co.—400 miles, proposed, Hamilton, Ont., to Toronto, Ont., to Montreal, Que., Canada.

Foreign Natural-Gas Pipe Lines—Planned and Under Way

Azienda Generale Italiana Petroli.—110 miles, 12-14-16-in., planned, Cortemaggiore to Genoa.

145 miles, 14-16-in., under way, Cortemaggorie to Torino. Completion date 1951.

Canadian Delhi Oil Co. (Subsidiary Delhi Oil Co.).—2,132 miles, proposed, Alberta, Toronto, Montreal.

VETERAN PIPELINER calls Bantam® "Best"!

CULVER 2145 PIPE LAYING

WILLIAM A. CURTIS CORPORATION
CONTRACTORS
583 HUMBOLDT ST.
ROCHESTER 10, N. Y.

July 9, 1951

Schield Bantam Co.
Waverly, Iowa

Gentlemen:

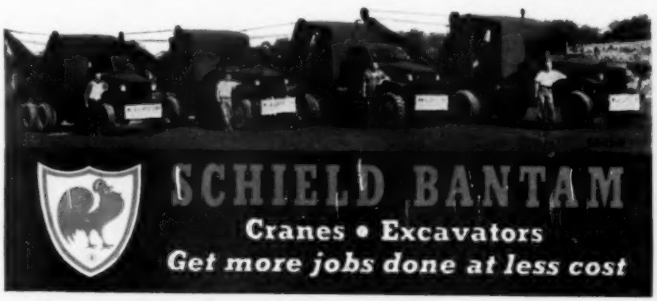
We have been in the business of pipe laying for 27 years. Through these years, we have found the Bantam Hoe does the most dependable job. Of all makes, the Bantam is the most adaptable for mobility, excavation, trenching, crane work, and handling of pipe. In canvassing our operators, to determine which equipment to invest in, it was their opinion that -- "Bantam will do the job best."

Very truly yours,
William A. Curtis Corp.

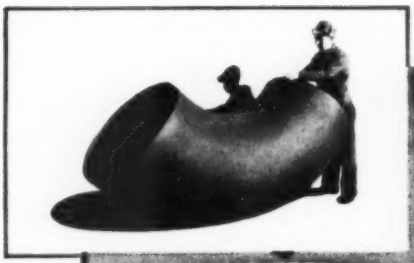
Charles J. Curtis
Secretary

When experienced pipeline contractors like Wm. A. Curtis Corp., Rochester, N. Y. buy *4 new Bantam Back Hoes in 4 years*, it should pay you to investigate. Here's why. Truck-mounted Bantam Hoe costs only a fraction of the price of bigger machines . . . yet gives you big work capacity, plus high speed mobility for handling widely scattered trenching, hoisting and backfilling jobs on a production basis. Write for details. Schield Bantam Co., 243 Park St., Waverly, Iowa.

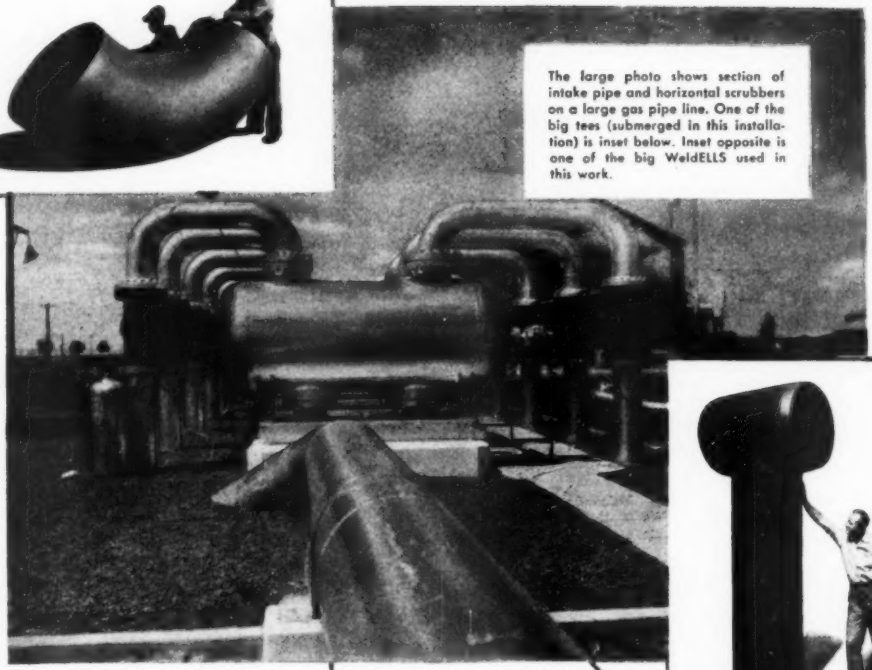
High-speed Bantam fleet brings new economies in pipe laying!



SCHIELD BANTAM
Cranes • Excavators
Get more jobs done at less cost



The large photo shows section of intake pipe and horizontal scrubbers on a large gas pipe line. One of the big tees (submerged in this installation) is inset below. Inset opposite is one of the big WeldELLS used in this work.



GUESS-WORK WON'T GO ON THE PIPE LINES

AS the demand for oil and gas mounted, the pipe lines grew. The first growth was in number and miles; then in size and pressure. The use of larger pipe lines under higher pressure has hurled a challenge at the pipe designer. To hold down costs he must press further toward the yield point of pipe line materials . . . but never too near the danger point. Sound engineering is indeed required to insure safe operation under loadings that stress materials at 65% to 85% of their yield strength. There is no "margin for ignorance" here. You must *know!*

Recent Taylor Forge contributions to the pipe lines include improved designs of WeldELLS in large sizes and tees giving greater safety at branch connections... produced in materials whose strength matches or exceeds that of the tough API5LX pipe now being used in transmission lines.

Ask for the facts about the WeldELL line of welding fittings and Taylor Forged Steel Flanges.

TAYLOR FORGE

TF WeldELLS®

TAYLOR FORGE & PIPE WORKS General Offices and Works: P. O. Box 485, Chicago 90, Ill. Offices in all principal cities. Plants at: Carnegie, Pa.; Fontana, Calif.; Hamilton, Ont., Canada.

OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

TRADE LITERATURE

1 CENTRIFUGAL BLOWERS. Construction features of multistage Type V centrifugal blowers for equivalent air pressures above 6.5 psig. and inlet volumes above 1,500 cu. ft. per minute are described in an eight-page bulletin. Illustrations include a complete cross-section of a multistage Type V gas exhauster, photographs of components of multistage Type V blowers, of two, three, and four-stage blowers with casing tops removed, and of typical installations in a variety of industries. *Allis-Chalmers Manufacturing Co.*

2 NEW NONINDICATING PRESSURE CONTROLLER, known as the Honeywell pressure pilot, is fully described in an eight-page catalog, which also covers principle of operation, specifications, design features, mounting dimensions, and other pertinent information. *Minneapolis-Honeywell Regulator Co., Brown Instruments Div.*

3 HOW TO BUILD CORROSION-RESISTANT FLOORS, a 16-page 2-color bulletin, describes in detail how to construct acidproof brick floors; uses of acid brick; application of different types of cement, and shows detailed drawings of various types of floors, as well as actual installation photos. *U. S. Stoneware Co.*

4 GAS AND OIL ENGINES in 7½ by 10 and 8½ by 10 CMA models for oil-well pumping are illustrated and described in Bulletin No. 511. A convertible model is offered which operates on approved, clean crude as well as fuel oil. Included in the bulletin are specifications of various oil and gas types available, and engine horsepower curves. *Ajax Iron Works.*

5 IQ-STEEL BRIDGE FLOORING. This new comprehensive folder discusses latest improved flooring which will carry H20 loading on a 15-in. circle up to a span of 48 in., and weighs approximately 19 lb., whether laid longitudinally or transversely on a bridge. It has been subjected to every known test for bridge flooring by one of the largest known independent firms of consulting engineers. *Kerlow Steel Flooring Co.*

6 SOIL COMPACTION, a seven-page bulletin, gives detailed information, including useful new production data, for figuring work schedules and costs on soil compaction jobs covering use of Barco portable gasoline rammer for tamping fill or backfill in restricted areas. Applications described include use of high degree soil compaction in construction work on roads, buildings, pipe lines, and utility trenches. *Barco Manufacturing Co.*

7 HYDRAULIC 51-R, an eight-page letter-file-size folder, gives complete information, including specifications and application data, on hydraulic jack and also contains photographs, detail drawings, and tabulated data on hydraulic equipment in capacities of from 10 to 100 tons. Simplex Re-Mo-Trol pumps and rams are featured, including a full listing of accessories and attachments. *Templeton, Kenly & Co.*

8 THERMOCOUPLE GLANDS designed for use with bare wire which provides for more accurate temperature measurements of gases.

FOR MORE INFORMATION . . . . use one of these cards

Postage Will Be Paid by Addressee

No Postage Stamp Necessary if Mailed in United States

BUSINESS REPLY CARD

Permit No. 3A, 34.9 P. L. & R., Tulsa, Oklahoma

THE OIL AND GAS JOURNAL
BOX 1260
TULSA, OKLAHOMA

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20)
(21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40)
(41) (42) (43) (44) (45) (46) (47) (48) (49) (50)

For further information—without obligation—I have checked numbered circles above

Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, Mar. 10, 1952

PLEASE PRINT

COMPANY NAME .....

STREET ADDRESS .....

CITY ..... ZONE NO. ..... STATE .....

NAME ..... TITLE .....

vapors, or liquids, and which have exclusive feature of using talc as a sealant, are discussed in Bulletin 951. A useful table is given on thermocouple wire providing gage number, diameter, circular mils and area and weight of wire per unit length. *Conax Corp.*

9 FLOW METERS. A 40-page bulletin describes instruments for recording, integrating, indicating, automatic controlling, and telemetering the flow of steam, water, air, gas, oil, solutions, and other fluids. Complete information is given on various types of meter bodies, operating principles, primary devices for flow measurement, recording charts, and accessories. *The Bristol Co.*

10 FROM PROBLEM CASTINGS TO PRODUCTION JOBS is a reprint of an article prepared by T. J. McLear, chief foundry engineer, The Copper Alloy Foundry Co. Based on the importance of close cooperation between design engineers and foundry engineers, this article describes in detail methods by which intricate stainless-steel castings were turned from problem castings into large-scale production jobs. *The Cooper Alloy Foundry Co.*

11 HYDRAULIC AND CABLE-CONTROLLED EARTHMOVING EQUIPMENT to match Allis-Chalmers crawler tractors is described in Bulletin No. 895. Attachments described include engine-mounted hydraulic control bulldozers, gradebuilders and root rippers, and the three cable-control units. Specifications are listed showing moldboard height and width, height of lift, depth of cut, degree of tilt, weight of blade and mounting, and over-all length of tractor and blade, for all models. *The Baker Manufacturing Co.*

12 BULLETIN HU-102 gives information on design and use of Hoobler undercarriage for flat beds, vans, high sides, tankers and other transports of semitrailer type. It includes pertinent data on axle spacing, self-steering operation, maneuverability, safety features, simplified backup, and maintenance operating costs. *The Union Metal Co.*

13 E-M SYNCHRONIZER, an article on standby or emergency power, written by E. W. Kammerer, E-M switchgear engineer, deals with requirements of standby power, types of service available, and a detailed discussion of controls for automatic start-stop operation. It is also fully illustrated with diagrams and typical installation pictures. *Electric Machinery Mfg. Co.*

14 NEW RELIANCE V-S DRIVE is a new, eight-page attractively illustrated booklet which presents a simplified, easy-to-read, nontechnical explanation of this drive, its "economics," application versatility, and operational flexibility in providing adjustable speeds from a.c. circuits. *Reliance Electric & Engineering Co.*

15 PRECISION BLENDING SYSTEM, a 12-page folder, describes construction, operation, flexibility and wide application of system for accurately blending two or more liquids in increments as low as 1/20 per cent. Sketches show simplicity and compactness as well as various types of installations. *Bowser, Inc.*

16 TRACTOR TOOL CATALOG features tractor tools for use with Caterpillar-built tractors and equipment. It includes complete line of Hyster tractor tools and graphically shows practical applications of equipment to multiply tractor uses and increase tractor production. *Hyster Co.*

17 V-BAND COUPLINGS. A complete catalog enables the user to specify couplings for the most highly specialized applications from a listing of standard series numbers. Sections include data on function, selection, and design. *Marman Products Co., Inc.*

18 MECHANICAL POWER TRANSMISSION PRODUCTS. Illustrated brochure describes such items as silent and roller chain drives, couplings, drive shafts, and clutches. *The Morse Chain Co.*

19 THERMOHMS, ASSEMBLIES, PARTS AND ACCESSORIES. 36-page catalog and buyers' guide, describes and illustrates entire line of general-purpose and specialized thermohms (resistance thermometers) used in plant and laboratory applications to detect temperature between —325 and +1,000 F. with accuracies from +0.18 to +3.0 F. It features a five-page tabular guide to aid in choice of correct thermohm. Photographs and specification tables are presented. *Leeds & Northrup Co.*

FOR MORE INFORMATION . . . . use one of these cards

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50

For further information—without obligation—I have checked numbered circles above

Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, Mar. 10, 1952

PLEASE PRINT
COMPANY NAME .....
STREET ADDRESS .....
CITY ..... **ZONE NO.** ..... **STATE** .....
NAME ..... **TITLE** .....

Postage Will Be Paid by Addressee

No Postage Stamp Necessary if Mailed in United States

BUSINESS REPLY CARD
Permit No. 3A, 34.9 P. L. & R., Tulsa, Oklahoma

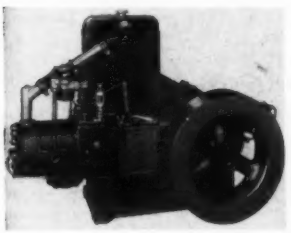
THE OIL AND GAS JOURNAL
BOX 1260
TULSA, OKLAHOMA

OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

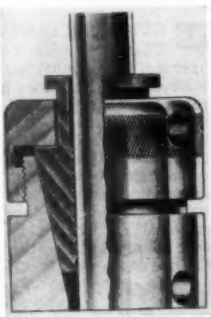
by Dan B. Miller

20 MODEL WL GAS ENGINE. This 5-in-bore by 6½-in.-stroke gas engine, a new oil-well pumping unit in the 5 to 12-hp. range is designed for low operating and maintenance costs. The wet-type cylinder liner is easily replaced in the field and eliminates oversize pistons and rings. Developed specifically for pumping lighter loads, this engine is compact, simple in construction, and easily accessible for maintenance. Recommended speed range is 400 to 900 r.p.m. Compression ratio is 5.6 to 1. The layshaft, which is enclosed in the engine bed, runs at twice engine speed, and incorporates a horizontal governor and an enclosed lubricator drive on the cylinder end. The magneto is similarly direct-connected to the layshaft at the crank end. Only a single pair of gears are in the engine, the gears between the crankshaft and the layshaft. *Ajax Iron Works.*



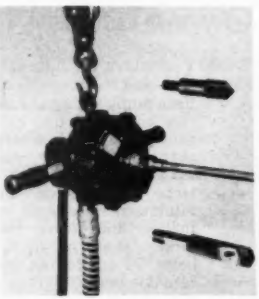
IT'S NEW CHECK IT

21 HUBER NO-BOLT CLAMP. A new polished rod clamp will handle any known sucker rod loads. Though small it features a unique wedging action which tightens its hold on the polished rod as the load is increased. It has been successfully tested on loads up to 126,000 lb. Because there are no bolts to tighten, the clamp is easily installed and adjusted. By using interchangeable slips, it can be adapted to any standard-size polished rod. Machined from cold-drawn, hardened steel, the No-bolt clamp is nickel-plated over copper. This heavy plating makes it rustproof and highly corrosion resistant in all exposures. Over-all weight of the clamp is 11 lb. *J. M. Huber Corp.*



IT'S NEW CHECK IT

22 CONDENSER CLEANER FOR SMALL STRAIGHT TUBES is equally efficient in removing hard or soft deposits. The control valve is actuated by a squeeze trigger located at the base of one of the operating handles. It actuates a simple throttle valve which can be regulated continuously from wide open to shutoff. This same trigger also controls the flow of water for cooling the drills and flushing out the loosened scale. The water-feeding mechanism features a new, self-adjusting packing which can be changed to handle either water or solvent, as the application demands. An improved heavy-duty electric motor, with trigger-controlled valve and builtin water-feeding attachment on the front end of the motor is also available for use where a supply of compressed air is not on hand. For soft, gummy deposits, where strong flushing action is required, a Drill Tip and adapter is employed (upper drill in photograph). For extremely hard deposits, a carbide-tipped drill is recommended (lower drill in photograph). *Elliott Co.*



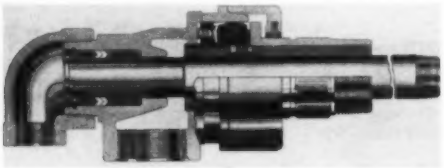
IT'S NEW CHECK IT

23 REVOLVING JOINT WITH STATIONARY OR ROTATING SYPHON. These joints are capable of handling up to 250-lb. steam pressure, and temperatures from minus 200° to plus 500° F. They are very short in over-all dimensions and are made in sizes from ½ to 5-in. inclusive. Rotation takes place on the flat face of a nonporous carbon disk the opposite side of which is a ball seat. This design permits the rotating sleeve to find its own rotating center. The seal inside the casing is a spring

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

seated Telfon wedge against a chrome plated surface. Face of the rotating sleeve is chrome plated and ground for hardness. The entire sealing assembly is one complete unit that can be removed without taking either rotating



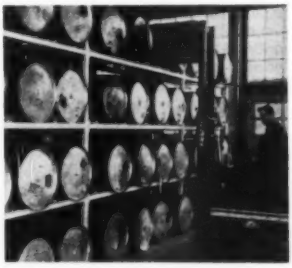
member from the roll. These joints require no lubrication, they have no bearings and require no flexible hose for mounting, unless this is required. *Rotherm Engineering Co., Inc.*

IT'S NEW — CHECK IT

24 POWER MUDMIXING UNIT employs an internal-combustion-engine drive. In the past, turbines have been employed on steam rigs while electric motors were used where sufficient power was available. These units were mounted on the Mudmaster frame on an incline and drove the mixer shaft with V-belts. To employ an internal-combustion engine, a right-angle gear drive was developed. A small engine, diesel or gas, which can deliver 20 hp. at 1,600 r.p.m. continuously, is sufficient to operate the unit. The unit is capable of effectively mixing the drilling mud with very low horsepower requirements and very little maintenance. *Texas Iron Works.*

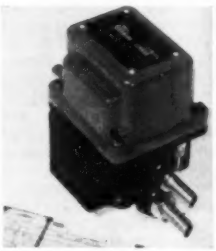
IT'S NEW — CHECK IT

25 NEW DRUM STORAGE RACK. Construction is of welded square tubular steel making it strong and capable of safely handling heavy loads. Principal advantage is that the racks permit stacking drums to ceiling heights while selection of any drum can be made without shifting or disturbing others. Design permits removal by fork truck and horizontal position makes possible the use of faucets for drawing off small quantities. Design lends itself to ready knock down and rearrangement to meet changing warehouse conditions. *Equipment Manufacturing, Inc.*



26 DIAMOND HARD METAL BANDS. Diamond-hard protective drill string collars are designed to add many extra feet of hole to the life of the drill string. These bands are easily applied to tool joints and drill collars, in the shop or in the field, by regular crews using ordinary welding techniques. The bands can be applied on badly worn joints by arc-welding flush on the outside surface, and on new joints by countersinking below the surface. Actual field tests during the past 2 years have shown that a single set of Diamond Bands added 50,000-100,000 extra feet of hole to the life of the drill string. *Diamond Hard Metals Products, Inc.*

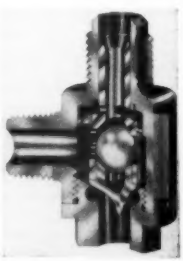
IT'S NEW — CHECK IT



27 MODEL 8 TORQUE MOTOR. This electromechanical actuator was designed primarily to stroke hydraulic servovalve pistons. It is usually driven from a servoamplifier utilizing two output tubes in push-pull. This actuator produces over 5 in./lb. of torque at a radius of .906 in. with 40 ma. differential current in its two coils (2,900 ohms each). It has a maximum stroke of ±.020 in., and less than 2 per cent hysteresis. The motor weighs 18 oz., and has a no-load natural frequency of 425 cycles per second. *Midwestern Geophysical Laboratory.*

IT'S NEW — CHECK IT

28 QUICK-RELEASE VALVE. This valve has no springs, operates fast, and has unusual wearing quality. It also has a high rate of discharge. It will close and seal with less than 10 lb. of pressure. Tests reveal that hundreds of thousands of engagements and disengagements were made without any evidence of wear. This valve, made of highest quality material, has an O-ring seal that can be replaced quickly without the use of special tools. It is made in ½-in. pipe size only with inlet to fit No. 10 high-pressure hose fitting. *Wichita Falls Foundry & Machine Co.*



IT'S NEW — CHECK IT

29 THREE NEW HEAVY-DUTY INDUSTRIAL ENGINES. The new units are equipped with overhead valves. Also available is a new Multa-Torque converter. It offers the advantages of a fluid coupling plus torque multiplication and is designed to absorb shock overloads, prevent stalling under excess loads, and start bigger loads faster. The new engines are the 317, the 279, and the 215. The number identifying each engine corresponds to its

RUGGED AND RELIABLE

Type "L30"

GUIBERSON'S
Deep Well Packer

Two-piece "G2" rubbers with metal spacer are interchangeable and optional at no extra cost.

For deep well work with high temperatures and pressures, use Guiberson's dependable "L30" Packer. It will give you long valve travel (30 inches) with minimum overall length at no extra cost. You can pull the "L30" surely and safely. The fast-action automatic latch, protected by a positive anti-lock device that assures ready release, snaps easily into latched position. Tough, long-wearing friction pads supply ample drag. Packing rubbers of advanced design will not vulcanize to the casing wall. All these features and others too are available on the "L30" in a wide range of casing sizes.

For circulating *above* the packer, Type "L30P" with perforated mandrel is available. Packers with longer or shorter valve travel may also be had on special order.

Better Be Safe Than Sorry

THE
GUIBERSON
CORPORATION

ESTABLISHED 1919 • DALLAS, TEXAS, U. S. A.

Sold By Leading Oil Field Supply Stores Everywhere

displacement in cubic inches. The 317 is rated at 140 b.hp. at 2,800 r.p.m. It is a V-8 with 3.8-in. bore and 3.5-in. stroke. The 279 is rated at 125 b.hp. at 2,800 r.p.m. It also is a V-8 and has 3.56-in. bore and 3.5-in. stroke. The 215 is a six-cylinder engine rated at 93 b.hp. at 2,800 r.p.m. It has a 3.56-in. bore and a 3.6-in. stroke. Free-turn valves are of high chrome-nickel alloy. All engines have heavy-duty, replaceable thin-shell precision, copper-leaded bearings. All are available either as engine assemblies or as complete power units. The Multa-Torque converter is for use with the 215, 239, and the 254 engines. *Ford Motor Co.*

IT'S NEW CHECK IT

30 CONTROL VALVE ASSEMBLY utilizes Conoflow pneumatic cylinder operators and Paul venturi ball valves. With the combination of these units it is possible greatly to simplify many difficult control problems involving corrosive fluids, abrasive materials, and high-temperature and high-pressure applications. The assembly can be used in conjunction with standard pneumatic control instruments for automatic control, or with manual loading stations for remote manual positioning. The streamlined venturi passages and smooth-surfaced ball provides a nonturbulent flow stream eliminating cavitation, as well as increasing capacity and improving controlability. Inherently a single-seated valve, the Paul principle reduces unbalanced forces to unusually low values so that the advantage of tight shut-off may be obtained without sacrificing control sensitivity. The assembly is available in sizes to 8-in. and in a variety of body materials including iron, steel, stainless alloys, and nonferrous materials. *Conoflow Corp.*

IT'S NEW CHECK IT

31 GLASFAB. As a supporting structure to bitumens or other waterproofing materials, Glasfab acts in a manner similar to reinforcing rods in cement or concrete. Because Glasfab is an inert material constructed of fiberglass yarn, it is not subject to "wicking" and other types of deterioration. It holds materials in uniform suspension, eliminating cracking that results in eventual breakdown. The flat fiber structure and weave of Glasfab permit unusual flexibility of the fabric, allowing tight application to uneven shapes and contours. The open weave permits "through" penetration of bitumen so that the glass fibers are completely surrounded and locked in the coating. Glasfab is produced in widths of 2 to 45 in. and in rolls of 50 to 500 yd. A 300-ft. roll 36-in. wide weighs only 9.5 lb. *Twinsburg-Miller Corp.*

IT'S NEW CHECK IT

32 NEW CONSTANT DIFFERENTIAL RELAY, TYPE 6000, is designed for purge systems, liquid-level, and specific-gravity measurements. It maintains a constant purge rate regardless of down-stream pressure changes. It is supplied with a fixed-flow-rate orifice and a differential indicator. Use of this equipment eliminates a supply pressure regulator. Pressure rating is 600 psi. Standard flow rates available are .5 to 1; 2 to 5; and 25 to 50 standard cu. ft. per hour. *Instruments, Inc.*

IT'S NEW CHECK IT

33 FUSE-DIN PRECISION THERMOMETERS. The over-all length of this armored thermometer is 14¼ in. It is protected by a stainless-steel tube ¼-in. o.d. The thermometer head is 1 in. in diameter and 1¼-in. long. The four terminals are fused into a disk of borosilicate glass. Several types are available in this form. For temperatures up to 300° C. Type PBM is cast in lead. The resistance unit is tungsten, fused into pyrex. For higher temperatures up to 400° C., the same resistance thermometer is available, cast in zinc. Internal leads may be silver or gold, depending on the user's requirements. To permit precision measurements up to a temperature of 1,500° C. Type PPC is a platinum thermometer, fused into a ceramic matrix. The internal leads are platinum. *Weiller Instruments Corp.*

IT'S NEW CHECK IT

34 FOUR-WHEEL DRIVE PAYLOADER has a 1-cu.-yd. bucket with 60-hp. diesel or 54-hp. gasoline power optional. The use of large pneumatic tires and drive on all four wheels gives unit tremendous traction and flotation to work effectively in sand, mud and snow and travel on pavements without injuring the surface. Rear wheel steer with power booster plus short wheel base makes it easy to operate and highly maneuverable. Four speeds in both directions insure fast travel speeds for transport and fast operating speeds on shuttle loading or similar operations. Fingertip-controlled hydraulic power raises and lowers and dumps and closes the bucket. *The Frank G. Hough Co.*

IT'S NEW CHECK IT

NATURAL GAS

PAD Inaugurates New Policy To Meet Possible Shortages

WASHINGTON.—The Petroleum Administration for Defense has abandoned plans to issue a blanket order establishing a priority system for industrial users of gas based on defense essentiality.

In its place, PAD has adopted a policy of directing gas supplies where they are needed to alleviate threatened shortages. The agency said it has given up the essentiality blanket order because it would be too hard to manage.

PAD took action under its new policy immediately by directing two natural-gas companies to supply six defense plants in Pennsylvania and West Virginia.

Manufacturers Light & Heat Co., Pittsburgh, was directed to supply about 2,000,000 cu. ft. of gas daily to five defense plants in Pennsylvania, and Natural Gas Co. of West Virginia was ordered to supply 300,000 cu. ft. per day to Continental Foundry & Machine Co., Wheeling, W. Va.

Orders will remain in effect until May 1. They provide that the companies may not curtail service to domestic consumers and may not acquire gas from other firms to serve the plants without specific PAD permission.

The five plants which will receive gas supplies from Manufacturers, together with the volumes ordered delivered, are: National Tube Co., Elwood City, 1,025,000 cu. ft. per day; Continental Foundry & Machine Co., Coraopolis, 500,000 cu. ft. daily; Pittsburgh Forgings Co., Pittsburgh, 272,000 cu. ft. daily; Wycoff Steel Co., Ambridge, 135,000 cu. ft. daily; Heppenstall Co., New Brighton, 67,000 cu. ft. per day.

T.I.P.R.O. to Join Texas in Defense of Gathering Tax

AUSTIN.—The Texas Independent Producers and Royalty Owners Association has announced its intention to join Texas in defense of the state's new gas-gathering tax.

The association has directed its attorney, Alvis Vandygriff, to appear in behalf of the tax and to file a brief supporting the state's case when District Judge Jack Roberts, of the 126th District Court, tries the first case March 17. Vandygriff will help Texas Attorney General Price Daniel.

Companies now have filed 48 law suits to recover more than $2,000,000 they have paid under protest during the first 4 months of operation under the new tax law. The tax took effect last September.

Before passage of the tax law, when the gas-tax question was before the state legislature, producers lined up in favor of the "gathering" levy in preference to any increase in the production tax, which falls principally on producers and royalty owners.

Phillips Operating New Sulfur-Extraction Plant

BARTLESVILLE, Okla. — Phillips Chemical Co. has placed in operation its new sulfur-extraction plant near Goldsmith in the Permian basin of West Texas.

The new plant will extract approximately 250,000 lb. to elemental sulfur per day from natural gas. Sulfur from the plant will be trucked in its molten state to Fort Worth, where it will be used in the manufacture of sulfuric acid. The sulfuric acid will be shipped to Phillips Chemical's Houston plant where it will go into production of ammonium sulfate.

A second extraction plant currently is under construction by the company in Crane County, West Texas.

Brooklyn Union Given O.K. To Convert Big Gas System

BROOKLYN.—The New York State Public Service Commission has given Brooklyn Union Gas Co. the go-ahead to convert its huge gas-utility system to straight natural gas.

The conversion, which will cost about $21,000,000, will be the largest project of its kind ever undertaken. Work will be handled by Conversion & Surveys, Inc., a subsidiary of Stone & Webster Engineering Corp. The conversion was scheduled to begin March 6, and completion is slated for September 4.

Natural Gasoline

Wilshire, Lone Star Start Work on Upton County Plant

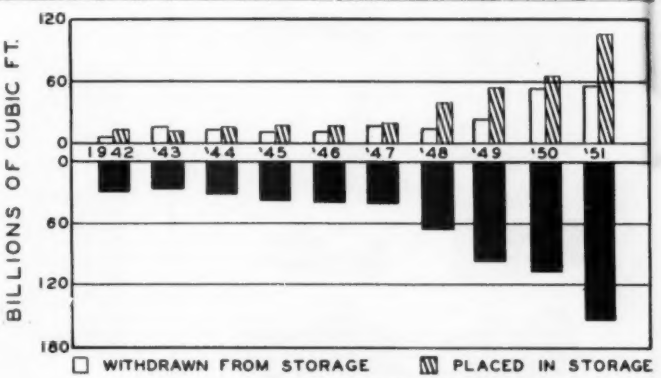
MIDLAND, Tex.—Wilshire Oil Co. and Lone Star Gas Co. have started construction of a new natural-gasoline plant in Wilshire-Ellenburger field of Upton County, Texas.

The new installation, to be owned jointly by Wilshire and Lone Star, will have a processing capacity of 50,000,000 cu. ft. per day of wet gas from Wilshire-Ellenburger field. It will cost in excess of $2,000,000.

Frank W. Lake, vice president and director of Wilshire, said it is planned to have the plant in operation early in May.

High Recovery Claimed

TULSA.—Sid Richardson Gasoline Co. is obtaining 99.7 per cent returns of L.P.G. on reproduction at its underground-storage project in the Keystone fields area of Winkler County, Texas. This figure appeared erroneously as 33.7 per cent in a story in the March 3 issue of the Journal on the company's application, then before the Texas Railroad Commission, to undertake a similar project in the same county.



RECORD STORAGE.—Despite record withdrawals of Columbia Gas System, Inc., from its underground gas-storage facilities in the Appalachian region during the fall of 1951, volume of stored gas rose to 155.1 billion cubic feet as of December 31, 1951. This figure represents a gain of 46 per cent over the volume of gas remaining in storage at the end of 1950. Withdrawals during 1951 were 56.7 billion cubic feet against 51.3 billion cubic feet in 1950.

For Easier, Faster, Pipe Cutting & Beveling

Shape cutting Attachments for cutting the various shapes of pipe intersections.

Out-of-Round Attachment is used when pipe is out of round.

Economical...

With the economical H&M you can save up to half of the time and labor in cutting and beveling pipe. This portable but durable machine makes a complete cut and bevel in a 12 inch pipe in about two minutes.

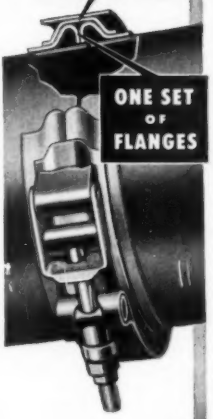
See for yourself. Let us arrange a demonstration.

H&M PIPE BEVELING MACHINE COMPANY
311 E. 3rd St. Tulsa, Okla.
Phone 3-0241

PUMPS
CENTRIFUGAL
RECIPROCATING
BUILDERS OF OUTSTANDING PUMPS
Since 1869

ESTABLISHED 1869
DEAN BROTHERS PUMPS INC.
INDIANAPOLIS IND.
323 W. TENTH ST.

MARMAN
COUPLINGS
Join Ducting, Tubing and Pipe without Bolted Flanges or Threads!



Marman Couplings assemble fast, hold tight, and seal positively. Strong circumferential pressure from the "V" band locks the flanged ends together. Simple rolled sheet metal or machined flanges can be made integral with, or added to, the duct, tube or pipe to be fastened. Joints can be made with or without gaskets.

Marman Couplings do away with expensive, heavy, bolted or threaded machine flanges. They are supplied in continuous or segmented design, either solid or ventilated. Tension is applied by T-bolt take-up or the patented Marman Quick Coupler which allows rapid assembly and disassembly. Marman Couplings are made to accommodate a wide range of temperatures, pressures and size requirements.

WRITE DEPT. J-3
for complete information on Marman Couplings

MARMAN PRODUCTS CO., INC.
940 WEST FLORENCE AVENUE
INGLEWOOD, CALIFORNIA

PIPE LINES

Corrosion Control

N.A.C.E.'s Tulsa Section holds annual short course

Paul Reed

TULSA.—Recent advances in field practices were revealed and demonstrated during the recent Short Course on control of pipe-line corrosion conducted by the Tulsa Section of the National Association of Corrosion Engineers. In the opening sessions of the course, C. E. Cloud, general superintendent of Oklahoma Natural Gas Co., emphasized that there is an economic limit beyond which it does not pay to go in eliminating holidays in pipe-line coatings. He said that in recent years his company has been coating all lines with the exception of a few gathering lines. Cathodic protection employing magnesium anodes, is applied immediately after construction by O.N.G., Cloud said.

The school was opened by J. N. Hunter, Jr., corrosion engineer, Service Pipe Line Co., chairman of the Tulsa Section of NACE. In the lecture and discussions conducted by J. R. Cowles, corrosion engineer, Oklahoma Natural Gas Co., and W. E. Huddleston, Huddleston Engineering Co., it was pointed out that some companies are now following a policy of installing one or two anodes wherever leaks are repaired. Losses of steel at corrosion pits on pipe lines have been estimated as amounting to 20 lb. per ampere per year.

Costs. — Installations costs including all items were said to come to $15.00 per 17-lb. magnesium anode and $1,500 per rectifier with ground bed. Installation of rectifiers was not recommended except where much more current is required than can conveniently be furnished by magnesium anodes.

Preliminary estimates of low-resistivity soil suitable for anodes and ground beds can be made advantageously for new lines by examing open ditch behind the ditching machine. On old pipe lines a pipe-line locator can be used effectively as a qualitative means for locating low-resistivity soils for further exploration.

Furthermore, it was pointed out, a pipe-line locator can be utilized for detecting holidays in coatings and discovering points where two pipe lines touch, as well as for the original purpose of locating buried pipe lines. Certain of these versatile instruments may even pick up radio programs occasionally.

Some locators can be used for holiday detection by the Pearson method. Accessories including special cleats on the shoes of two men carrying the instruments were demonstrated. A dummy pipe line was set up for demonstration of typical examples of pipe to soil readings.

Anode life. — Practicable anode life was stated to be from 2 to 12 years. The 17-lb. anode has become popular because it has been found that anodes as large as 32 and 54 lb. will not give much more protection in Oklahoma soils.

Pipe-to-soil potential measurements in frozen ground have no significance because frozen ground is a poor conductor.

Demonstrations were given of the installation of insulating flanges and of insulating devices at road-crossing casings. Significant instruments and devices were displayed, and wrapping of pipe with several tape materials demonstrated. A new method was shown for utilizing a special heavy-paper mold for applying short applications of hot enamel in covering welded and coupled joints.

Plant operations were observed at shops of Tulsa Pipe Coating Co., Allied Paint Co., and Standard Magnesium Corp.

Hearing Near on Proposed Gulf-Michigan Gas Trunk

WASHINGTON.—Gulf-Michigan Gas Transmission Corp.'s proposal to build an $85,000,000 natural-gas trunk line from Louisiana to Indiana will be heard by the Federal Power Commission here March 20.

The St. Louis firm would build the 680-mile, 30-in. line from Perryville, La., to a point near St. John, Ind., where it would connect with facilities of Michigan-Wisconsin Pipe Line Co. The project also would include construction of a 25-mile lateral line to serve the St. Louis area, which would extend west from Belleville, Ill., to the Mississippi River opposite St. Louis.

Capacity of the system initially would be about 350,000,000 cu. ft. of gas per day. Michigan-Wisconsin would receive 200,000,000 cu. ft. of the total with the remaining 150,000,000 cu. ft. going to the St. Louis area.

The commission has permitted 14 petitioners to intervene in the proceedings. They are: Central Wisconsin Gas Co., Railway Labor Executives Association, Fuels Research Council, Inc., Anthracite Institute, National Coal Association, United Mine Workers of America, Chesapeake & Ohio Railway Co., Illinois Power Co., Panhandle Eastern Pipe Line Co.,

PERRAULT

GLASS PIPE WRAP

★ PIPELINE FELT

★ PIPELINE KRAFT WRAP

★ ROCK SHIELD

"Everything for the Pipeliner"

PERRAULT Brothers

1130 NO. BOSTON, TULSA, OKLA. • 5-1103

Export Office:
30 ROCKEFELLER PLAZA
NEW YORK, N.Y.
CIRCLE 6-6260

EXPANSIBLE INTERNAL PIPELINE CLEANER

DESIGNED AND PROVEN BY PIPELINE MEN

All sizes 6" to 30"

UNLESS YOU ARE USING THE EXPANSIBLE CLEANING MACHINE, YOUR LINES ARE NOT BEING THOROUGHLY CLEANED.

EXPANDS for constant pressure on all sides. Compensates for brush wear.

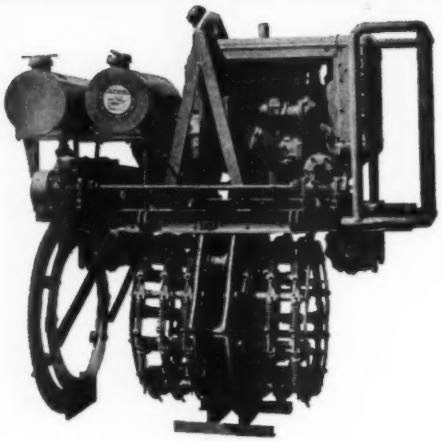
FLEXIBLE to eliminate stoppage on bends, drops, etc. Can traverse 90° 1½ radius tube turns.

EFFICIENT cleaning pays off in increased gas volume.

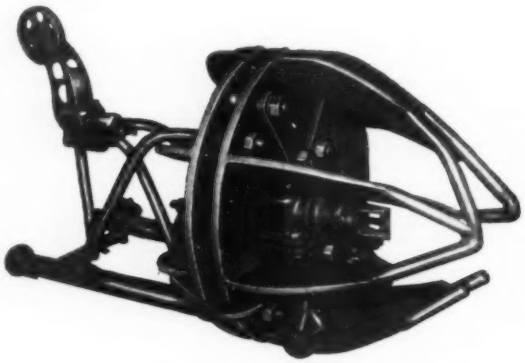
CLEANER PIPELINES CO.

1900 Armour Rd. No. K. C. 16, Mo.

For Cleaning and Lineup



MODEL "K" PIPE CLEANING AND PRIMING MACHINE can be set up to clean and prime pipe from 16" to 26" in diameter. May be used line-traveling or on stationary base. This machine is also available for larger pipe sizes.



CROSE INTERNAL LINEUP CLAMPS are available in manual, electric and hydraulic models for pipe sizes ranging from 12" to 36". Crose Internal Lineup Clamps have been proven in world-wide field operations.

M. J. CROSE

MANUFACTURING COMPANY, INC.

2715 Dawson Road TULSA, OKLA. Phone 6-2173

Natural Gas Pipeline Co. of America, Michigan Public Service Commission, Wisconsin Public Service Commission, and the cities of Milwaukee and Detroit.

New York State Natural to Launch Expansion Program

WASHINGTON.—New York State Natural Gas Corp. has been given the go-ahead by the Federal Power Commission to lay about 105 miles of new gas-transmission lines in New York and Pennsylvania and add 1,820 hp. at two compressor stations in Pennsylvania.

The new 20, 16, and 14-in. lines will be laid in five sections in Westmoreland, Armstrong, Tioga, and Potter counties, Pennsylvania, and in Wyoming, Onondaga, and Cayuga counties, New York. Four of the sections will parallel existing transmission lines, while the fifth will replace an existing line. Additional compressor horsepower will be installed at Pennsylvania stations in Westmoreland and Tioga counties.

The new facilities, estimated to cost more than $6,000,000, will increase delivery capacity of New York State Natural's system by about 100,000,000 cu. ft. of gas per day. New capacity will be used to meet normal expected increases in demand of existing markets, particularly those in Syracuse, Rochester, Utica, Albany, and Buffalo, N. Y.

The company expects peak-day delivery this winter to be about 708,000,000 cu. ft. When all authorized facilities have been placed in operation, it expects to handle a 1953-54 peak-day demand of about 909,000,000 cu. ft.

Service Completes 18-Mile Crude Line to Sugar Creek

KANSAS CITY, Mo.—Service Pipe Line Co. has completed construction of its new 16-in. crude pipe line from a connection with its system to the Sugar Creek, Mo., refinery of Standard Oil Co. (Ind.).

The 18-mile line, which ties into Service's existing system near Outerbelt Road in southern Jackson County, will replace a 10-in. line in operation since 1923. It was filled February 1 and tested until February 12. Capable of delivering 68,000 bbl. of crude per day, the line will handle only about 38,000 bbl. until the refinery's expansion program, currently underway, is completed.

J. J. Sheehan Pipe Line Construction Co. has completed all constructiton work on the line except for cleanup and backfill.

The new line is Somastic coated, with the last 4 miles to the refinery, running through Independence and Sugar Creek, Mo., encased in concrete for additional protection.

Carrol M. Shanks,
President,
The Prudential Insurance
Company of America, says

"PRUDENTIAL Lives in Houston *because*.....

NEW PRUDENTIAL BUILDING

...Houston has become a key city of the progressive Southwest — an area whose people and economy are making ever increasing use of Prudential insurance protection and investment dollars.

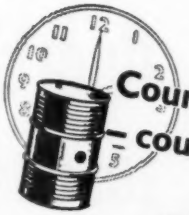
"To bring both these important services closer to our Southwestern policyholders and to the business, industry and agriculture of this great region, Prudential will soon occupy its new 18-story Southwestern Home Office building, now nearing completion on Holcombe Boulevard at Main St., in Houston."

You'll enjoy good living at The Shamrock everytime you come to Houston.

For reservations, write, wire or call

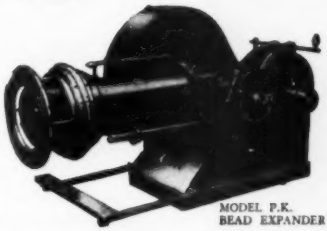
Teletype:	Long Distance:
HO-192	Houston LD 1

The Shamrock
HOUSTON
GLENN McCARTHY, *President*
M. JACK FERRELL, *Managing Director*



Count the minutes count the Drums!

MODEL V.P. DOUBLE CRANK PRESS



MODEL P.K. BEAD EXPANDER

From the sheet to the finished container involves as little as eleven operations; illustrated are three of the machines required—for forming ends, expanding beads and double seaming drum bodies. If you wish to speed up your output choose MOON machines—the complete plant averages a drum a minute.

MOON
Regd. Trade Mark

LONDON OFFICE: Abbey House, 2/8 Victoria Street, Westminster, London, S.W.1, England. Cables: Moonbro, Sowest, London, England.

MOON BROTHERS LIMITED, BEAUFORT ROAD, BIRKENHEAD, ENGLAND
Cables: "Moonbro" Birkenhead, England

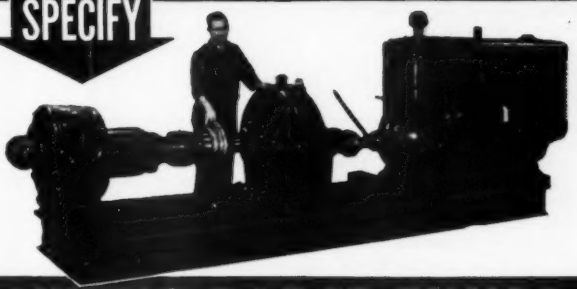
AGENTS IN U.S.A.: M. Neumunz & Son Incorporated, 90 West Street, New York 6, New York
AGENTS IN CANADA: Dominion Welders & Machinery Ltd., 322 Lumsden Avenue, Toronto 13

MAKERS OF TIN BOX AND DRUM MAKING MACHINERY

dm MB 47

For... **FAST, SURE PRIMING**
POSITIVE DELIVERY
STRIPPING TANKS

SPECIFY



VIKING BARGE PUMPS

There is a Viking pump for all cargo loading and unloading from gasoline to molasses.

Full range of capacities up to 1050 gpm. All types of mounting arrangements. Any type of power.

For a complete story, send today for free bulletin 2900 and additional sheets Sp400 through 409.

See Our Catalog In SWEETS

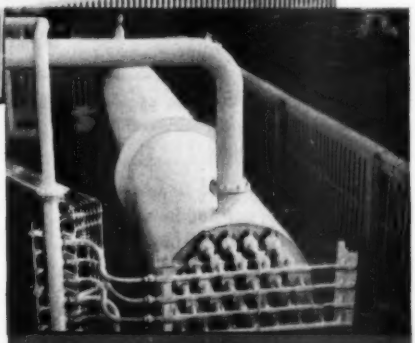
Viking PUMP COMPANY
Cedar Falls, Iowa

fluor's modern research facilities

test new developments — verify efficiency

At Fluor, the proof of the design is in the testing. *Before* new Cooling Tower developments are incorporated into standard design, they are subjected to rigorous tests in this modern, commercial-size tower testing laboratory. Here, design and performance efficiency of every new development is determined through complete ranges of actual heat transfer conditions. Realistic rating data is established under conditions *paralleling* those of plant and process operations.

Fluor Cooling Tower Testing Facilities. This commercial-size installation consists of a pump house, instrument house, 20,000,000 BTU/H boiler, test basin, and a 40' high test tower.



This specially designed Dutch Marine-Type Boiler provides varying heat loads to the test tower. Fired by 12 hydraulically-controlled burners operating on either natural gas or propane, the boiler delivers a maximum heat load of 20,000,000 BTU/H.

Testing is controlled from this single panel. Instrumentation includes measurement and recording of heat loads and water flow rates, air temperatures, hot and cold water temperatures, air static readings and all other pertinent data, under a variety of conditions.

What this means to you . . .

The motivating power behind Fluor's continuous research and development program is to *always* provide the most efficient cooling tower available. This fact, combined with Fluor's 30 years of active experience in designing major cooling tower installations for the petroleum, chemical, and power industries, means many things to the man seeking a factual tower recommendation to meet his exact cooling requirements.

A Fluor Cooling Tower recommendation means that all variables are included and compensated for. It means that all component parts, as well as all design theory, have been tested and evaluated under actual operating conditions. And, it means that a Fluor-designed cooling tower will perform at *rated* heat transfer efficiency under the conditions of installed operation. *You can be sure with Fluor!*

FLUOR

Designers - Engineers - Constructors - Manufacturers

THE FLUOR CORPORATION, LTD., 2500 S. ATLANTIC BLVD., LOS ANGELES 22, CALIF.
New York, Chicago, Pittsburgh, Boston, Tulsa, Houston, San Francisco, Birmingham and Calgary

Represented in the Sterling areas by:
Head Wrightson Processes Ltd., Teesdale House, Baltic Street, London, E.C.1., England

SINCE 1890

REFINING

Cities Service Cat Cracker Ends Record-Breaking Run

LAKE CHARLES, La.—A catalytic cracking unit at Cities Service Refining Corp.'s refinery here recently completed a world's record-breaking run when it was shutdown after being on stream a period of 1,058 days, just shy of the 3-year mark by 37 days.

The unit, the "B" cat cracker at the 150,000-bbl. plant, was placed on stream February 19, 1949, and went off stream on January 13, 1952. During this period it processed a total of 41,784,348 bbl. of feed, circulated 45,054,360 tons of catalyst in the process, and burned 301,005 tons of coke.

The Cities Service refinery first went on stream in 1944 as an 80,000 bbl. plant and has since been expanded to its 150,000 bbl. crude-charge capacity. At the present time, a 20,000 bbl. fluid hydroforming unit is being installed at the refinery.

Eastern States Plans New Ethylene Unit at Houston

HOUSTON.—Eastern States Petroleum Co. revealed preliminary plans last week to build a $4,000,000 ethylene plant as an addition to its 50,000-bbl. refinery here.

R. B. Kahle, company president, said date for beginning construction has not yet been set and that it is too early to reveal other details. The company's intention to build the new plant was disclosed soon after completion of a multimillion-dollar expansion program at the refinery. The program included installation of the world's first Udex unit which extracts benzene and other hydrocarbons from a platformate charge *(The Oil and Journal, March 3, page 55)*.

Construction of the new ethylene unit would make Eastern States' second venture in the petrochemicals field.

Union Expansion Program At Los Angeles Progressing

LOS ANGELES.—Union Oil Co. is well along with a $27,000,000 program of expansion and additions to refining equipment at its Los Angeles plant, despite shortages of construction materials which may delay completion of some projects.

Included in this program is a new 26,500-bbl. fluid catalytic cracking unit, which, when completed in mid-year, will provide Union with the largest total catalytic cracking capacity on the West Coast. To furnish feed stocks for this unit, as well as increase the plant's crude-throughput capacity, a new 40,000-bbl. crude-topping and vacuum-distillation unit is under way. It is scheduled for completion in November.

In addition to these installations, a 15,000-bbl. gasoline acid-treating plant is being erected. Existing process facilities, including a Thermofor catalytic cracking unit, Unisol gasoline treating plant, crude combination distillation unit, and a hydrogen sulfide-recovery plant are being rearranged for integration with the new units. A 50-ton sulfur-recovery plant costing $450,000 is being added, while a 75-ton, $750,000 ammonium sulfate plant is scheduled for completion in early 1953.

A proposed new unit for the Los Angeles plant now being designed by the manufacturing department, is a 15,000-bbl. continuous coker.

Water Supply Approved for Projected Petrochem Plant

AUSTIN.—Union Carbide & Carbon Co. has been granted permission by the Texas Board of Water Engineers to use 126,000 acre-ft. of water annually from the Guadalupe River in operations at its planned new petrochemical plant.

The projected plant, estimated to cost $43,000,000, would be built on the Texas Gulf Coast near Seadrift, 20 miles southwest of Port Lavaca. Contracts reportedly have been signed with two natural-gasoline plants for a supply of ethane and methane to be used in the manufacture of polyethylene and ethylene glycol.

The company petitioned the board of engineers to allow it to use the water for cooling purposes at the plant. After serving its cooling function, the water would be returned to the river unchanged except for a 20° rise in temperature, the company said.

Action Put Off on Proposed Lube-Oil Designation Change

NEW YORK.—Decision on a proposed change in automotive lubricating-oil designations has been put off by executive-committee members of the board of directors of the American Petroleum Institute until the full board meets April 29-80 in Tulsa.

B. G. Symon, chairman of the recent meeting of the A.P.I.'s lubrication-committee at Detroit, reported that a ballot vote tabulated by the general committee of the Division of Marketing supported the new system of service classifications and designations for automotive crankcase oils.

THE INFERNO OIL BURNER

★ Good Design Features.
★ Any Gravity Fuel Oil at Any Pressure.
★ Will Not Clog.
★ Economical.
★ Makes Perfect Fire.
★ More Horse Power.
★ Easy to Install.

Sold through supply stores or direct. Write for copy of Bulletin 13-B.

The INFERNO CO.
Box 1138A
115 RICOU St.
SHREVEPORT, LA.

For Mid Continent service, call on J. B. Gill Company's Tulsa office

Our Tulsa office, 415-417 Oil Capital Bldg., 507 S. Main St., offers experienced counsel in construction and engineering operations.

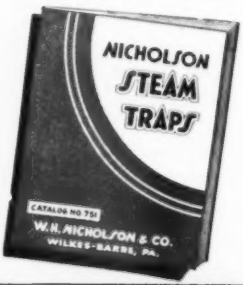
We invite your inquiries

J. B. Gill Co.
ENGINEERS
29th & Orange Avenue
Long Beach, California

SEND FOR

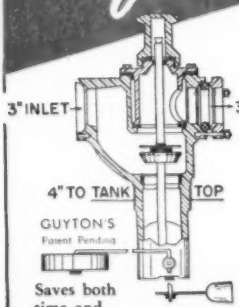
Nicholson Trap Catalog 751

Newly revised, this standard 32-page reference describes traps for all mediums: thermostatic and metal expansion for pressures to 225 lbs; weight and piston-operated for heavy duty. Complete with installation diagrams and formulae for determining proper size trap.



W.H. NICHOLSON & CO
TRAPS · VALVES · FLOATS
210 Oregon St., Wilkes-Barre, Pa.

STOCK TANK
Switching Valve



Saves both time and money on stock tank hook-ups. Poppet type valve is set manually, then it switches flow from tank to tank (or by-passes a tank) automatically. Field proven by many major oil companies. *Write for complete Bulletin.*

MURDOCK
TANK & MFG. CO.
TULSA, OKLAHOMA.

Symon indicated that the plan was approved initially when the lubrication committee convened for its annual meeting in Chicago last November.

Fast Tax Write-Offs O.K.'d For More Refining Facilities

WASHINGTON.—Certificates of necessity for accelerated amortization have been granted by the Defense Production Administration for more than $37,000,000 worth of tanker construction.

The largest project certified was that of Sun Oil Co. for $15,200,000. Other projects covered investments of $12,000,000 by Sinclair Refining Co., $5,050,000 by Gulf Oil Corp., and $5,000,000 by the Stockard Steamship Corp., New York. All of the projects were granted 60 per cent rapid write-off.

Certificates also have been issued for a $1,216,330 investment in refining facilities by The Texas Co. in Los Angeles Harbor and Wilmington, Calif.; 65 per cent in $404,100 and 40 per cent on $812,230; $300,000 in aviation-oils facilities by Shell Oil Co. at Deer Park, Tex., 65 per cent; $105,000 for gasoline storage by Humble Oil & Refining Co. at Irving, Tex., 40 per cent; and $346,000 for oil storage by Socony-Vacuum Oil Co. at Albany, N. Y., 40 per cent.

Air-Pollution Symposium Scheduled for April 14

NEW YORK.—A symposium on atmospheric pollution, sponsored by the Technical Societies Council of New York, Inc., will be held here April 4 at the Keystone Room, Hotel Statler.

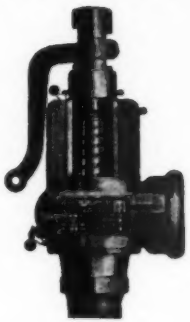
The panel will discuss practical methods on efficient reduction of air pollution, touching on evaluation of the air-pollution problem, environmental problems, methods of study and control, and problems peculiar to metropolitan New York and New Jersey areas.

The New York sections of 17 technical societies are included in council membership. T. R. Leadbeater, Ford Instrument Co., Long Island City, has been named program chairman for the meeting.

Refining Brief

President of Red Bank Oil Co., Frank W. Bennett, announced last week that Red Bank will establish a central office in Houston and at the same time said that the firm is now carrying on negotiations to buy a refinery in the Houston area. Further details on the possible refinery acquisition were not disclosed. Red Bank's present offices are at Charleston, W. Va., New Orleans, New York, Corpus Christi, and Refugio, Tex.

INFERNO



Users of Inferno Safety "Pop" Valves will tell you they are hard to beat. Five styles to suit your needs. Guaranteed without time limit against defective material or workmanship. Sold through your supply store or direct. Write for Bulletin 11-E.

The INFERNO CO.
Box 1138A
115 RICOU St.
SHREVEPORT, LA.

OIL and GAS BURNING EQUIPMENT
for
PETROLEUM REFINERIES

Detailed Information Gladly Sent Upon Request
CHEMICAL-PETROLEUM DIV.
NATIONAL AIROIL BURNER COMPANY, INC.
1236 E. SEDGLEY AVE., PHILADELPHIA 34, PA.
Southwestern Division: 2512 So. Blvd., Houston 6, Tex.

ALLOY STUDS
to your
specifications

For better alloy fastenings, try VICTOR—over 30 years of service to the petroleum industry. Prompt quotations furnished.

Ask for the new VICTOR catalog

VICTOR PRODUCTS CORP.
7505 W. BELMONT AVE. · CHICAGO 18, ILL.

THIS MODERN *2-Piece Union* OFFERS *Money-Saving Advantages*

Yale's O-Ring sealing principle (patents pending) makes possible this truly modern blank cap union. The many advantages it offers add up to greatly increased efficiency . . . and that's the reason so many lines are now installing YALE 2-Piece Unions on strainers, scraper traps and manifolds.

LIGHTER!

. . . and stronger, also, and there's no loose, unnecessary pieces to lose or damage.

NO HAMMERING OR BOLTING

A positive pressure seal is obtained by snapping up the cap.

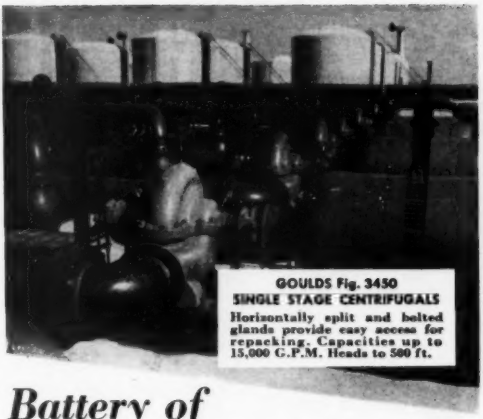
SAFER TO HANDLE

The solid, one-piece cap is made up, broken out, opened and closed without undue exertion or danger.

WRITE TODAY FOR COMPLETE INFORMATION

YALE
MACHINE WORKS

Telephone ME-4282 - P. O. Box 10117
HOUSTON 7, TEXAS
EXPORT: R. S. STOKVIS & SONS CO., NEW YORK, N. Y.



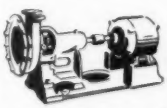
GOULDS Fig. 3450 SINGLE STAGE CENTRIFUGALS
Horizontally split and bolted glands provide easy access for repacking. Capacities up to 15,000 G.P.M. Heads to 500 ft.

Battery of GOULDS Centrifugal Pumps *gives dependable service*

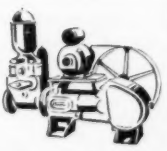
Here is a battery of Goulds 10″ double suction, split case centrifugal pumps at work for a well-known oil company in the Lake Charles area. These Goulds and hundreds of others throughout the oil industry are giving heavy-duty, 24-hour-a-day, trouble-free service.

Oil men choose Goulds pumps for several reasons. First, they are low in cost. Second, they offer high efficiency pumping with relatively low power consumption. Third, their simple, sturdy construction assures long service life and low maintenance costs. These Goulds pumps offer other important advantages, too. Interchangeable parts permit reduced inventories. A wide range of capacities and heads affords versatile application. For complete information and specifications on the Goulds Fig. 3450 pumps shown above, write for Bulletins 721.1 and 721.2.

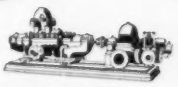
Other Outstanding GOULDS for the Oil Industry



GOULDS Fig. 3705
Stainless steel pump for handling acid and alkaline liquors. Capacities up to 600 G.P.M. Heads up to 160 ft.



GOULDS Fig. 1813
High-quality "New Pyramid" double-acting piston pumps. Six sizes. Capacity ranges from 7 to 58 G.P.M. Heads up to 580 ft.



GOULDS Fig. 3360
High pressure multistage centrifugal. Two hydraulic arrangements available.

THE NEWS THAT'S SWEEPING THE OIL FIELDS

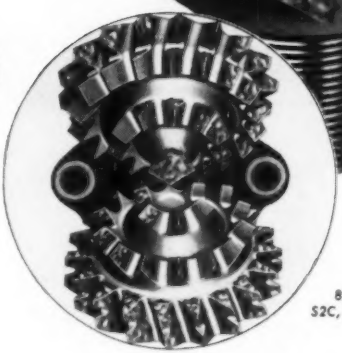
Faster Drilling Than EVER BEFORE

WITH

GLOBE

"2-CUTTER"

Integral JET ROCK BITS



Globe Jet Rock Bits are now available in all popular sizes from 8½" to 15", in types SS2C, S2C, M2C, MH2C, and H2C.

Pioneered by Globe, the integral jet principle has made possible faster drilling, with fewer bits, at lower cost. With power rigs or steam rigs, with large rigs or small rigs, the story is the same . . . faster, more efficient, more economical drilling, with Globe "2-Cutter" Integral Jet Rock Bits.

Globe "2-Cutter" Jet Bits were painstakingly engineered to handle the high mud volume and pressure of jet drilling. They've had their "work outs" in Texas, Oklahoma, California, in all field conditions. Here is a performance-tested answer to the problem of rising drilling costs. Your Globe representative will help you switch over to the new, dollar-saving jet bits. Call him today for detailed, factual information.

Jet Nozzles are made of Tungsten Carbide to hold up under highest mud pressures . . . 5/16", 3/8", 11/16" and 3/4" diameters.

GLOBE

OIL TOOLS

Branches in: BAKERSFIELD AND VENTURA, CALIFORNIA • CASPER, WYOMING • DALLAS, HOUSTON, ODESSA AND TYLER, TEXAS • DUNCAN, OKLAHOMA • LAKE CHARLES, LOUISIANA.

Main Office and Plant:
LOS NIETOS, CALIFORNIA

Among the

Drilling Contractors

86 Companies Operate Rotary Rigs in Canada

Companies owning and operating rotary rigs in western Canada have increased from 48 a year ago to a present total of 86. Rigs operated by them in the region now total 237 as compared with 148 a year ago. Another regular survey reported elsewhere in this issue lists 181 active rotary rigs in the region but includes only those rigs actually making hole.

With few exceptions, all rigs in the region are owned and operated by drilling contracting companies. Heading the list is Commonwealth Drilling Co., Ltd., a Canadian firm headquartered at Calgary. Two other Canadian firms also are among the top three contractors in the region in number of rigs owned. An American-owned company, Can-Tex Drilling Co., holds fourth place.

Rig ownership in the region follows: Commonwealth Drilling Co., Ltd., 20; Regent Drilling Co., 15; General Petroleums, Ltd., 13; Can-Tex Drilling Co., 11; McIvor Drilling Co., Ltd., 9; Parker Drilling Co., 9; Brinkerhoff Drilling Co., 8; Trident Drilling Co., 7; Cascade Drilling Co., 6; Arrow Drilling Co. (Canada), Ltd., 5; Husky Oil & Refining, Ltd., Imperial Oil Ltd., Lodestar Drilling Co., Shell Oil Co., Trinidad Leaseholds, Ltd., Canbridge Corp., Paul Guthrie Development Co., and Precision Drilling Co., 4 each; miscellaneous (companies with fewer than 4 rigs), 102.

Goldstar Drilling Co. and **Survey Drilling Co.**, both of Calgary, are the contractors on two new wildcat tests which the Sohio group is drilling in the Yorkton area of Saskatchewan Province, Canada. The former's rig is located near Drobot, in LSD 16, 22-29-6w2. Survey's rig is on Sohio's Otthon test in LSD 12, 24-24-5w2.

Penrod Drilling Co., Shreveport, is getting started on a 13,000-ft. test in the Duck Lake field, St. Martin Parish, coastal Louisiana, where it is drilling for Hunt Oil Co. and Arkansas Fuel Oil Co. Location is on the operators' State lease 1,392 in its Schwing unit in 2-15s-11e.

Fortenbery Drilling Co., Natchez, Miss., has the contract for a projected 7,500-ft. test which R. A. Campbell of Vidalia, La., is starting at a wildcat location a mile west of the Fairview field and 2¾ miles northeast of Ashland, Concordia Parish, eastern Louisiana. Location is on the operator's James-Wharton lease in 10-4n-9e.

Reserve Drilling Co., Casper, Wyo., is moving a rig to a new wildcat location which it will drill for Argo Oil Co. and associates on the latter's Ogallala block, northwest of Bruel, in Keith County, Nebraska. The test will be 1 Kahl, with location in the NW NW SE 6-13n-40w.

Wagner & Wyant Drilling Co., Amarillo, Tex., and Denver, is drilling for Wytex Oil Co. and Derby Oil Co. at 1 Hagemeister, an extension test in the Potter area, Kimball County, Nebraska. Location is in the NE NE SW 3-13n-53w.

Festervan & Callaway are drilling for Farmer & Sons at 3 Robertson, a new Nacatoch sand operation in the Bellevue field, Bossier Parish, northern Louisiana. Location is in 10-19n-11w.

Veeder Supply & Development Co., Cherryvale, Kans., is moving a rig to a location on the east flank of the Bemis pool, in Ellis County, Kansas, where it will drill under contract for H. A. Horwitz of Tulsa at 1 Potter, SW SW NW 29-11-16w.

Mountain States Drilling Co., Denver, has a new wildcat job under way for Carter Oil Co. in the area about 10 miles southwest of Vernal, in Uintah County, northeastern Utah. Location is on a government lease in C SW SW 9-6s-21e.

Kemp Drilling Co., Shreveport, has a new 10,000-ft. test under way in the Glenmore field, Rapides Parish, Louisiana, where it is drilling for Texas Pacific Coal & Oil Co. Latest operation is 7 Bentley, in the C SW SW 35-1s-2w.

Harry L. Edwards Drilling Co., Houston, is starting a 13,000-ft. test for Pan American Production Co. in the Lake sand field, Iberia Parish, Louisiana Gulf Coast. Location is on the operator's State lease 1,866.

Hinkle Drilling Co., Houston, is keeping a rig working for Gulf Refining Co. in the Hayes field, Calcasieu Parish, coastal Louisiana. It now is drilling at 3 Hayes Unit 1, in 17-11s-5w. Contract is for 9,700 ft.

Noble Drilling Co., Tulsa, has been awarded a contract for a deep exploratory test which The Texas Co. will drill in Love County, southern Okla-

What are we

waiting for?

There *you* are with a well to dig as fast and as safe as you can—and here *I* am with the world's best tongs, elevators, links and hooks. So, what are we waiting for? We ought to get together *pronto* and do the job right! ★ You can tell at first glance that Web Wilson Oil Tools are what every fast-moving, safety-minded crew has been hoping for—and I can refer you to plenty of smart oil men who wouldn't use anything else. ★ If I don't get to you first, why not call me at New Iberia 155—the name is Johnny Deaver—and we've got a lot of things to talk over.

Be sure the connections ARE LEAK PROOF!

Make them up with RECTORSEAL!

• You'll never have to worry about connection leaks on Fuel, Water and Air lines; Tubing and Casing connections when you make them up with RECTORSEAL. Apply Rectorseal directly from the container. It sets-up quickly to a plastic elasticity that positively seals the connection . . . and keeps it sealed until broken-out.

Ask for Rectorseal by name at your Supply Store. If they can't supply you, write

RECTORSEAL, Dept. D
2215 Commerce St., Houston 2, Texas

RECTORSEAL
Manufactured by
RECTOR WELL EQUIPMENT CO., INC.
Fort Worth, Texas
MAKING THE OIL INDUSTRY SAFER

homa. Location, in the NW SE NW 1-8s-2w, is about 3½ miles east of Leon and about 2½ miles east of a Deese sand discovery well recently completed by Sinclair Oil & Gas Co.

Dunbar Drilling Co., Salem, Ill., is drilling a 6,400-ft. Morrison test in eastern Adams County, Colorado, for Roden, Darden & McRae. This new wildcat operation is designated as 1 Middlemist. Location is in the NE NE SW 20-2s-57w.

B. B. Carter is the contractor on a deep wildcat test which Bay Petroleum Corp. is starting in the Keota area, Weld County, Colorado. Location is for 1 McKay, in the SE SE NW 12-9n-62w. Hole is projected to the Morrison sand.

W. I. Lewis, Mt. Vernon, Ill., has a rig working for Vaughey & Vaughey on a wildcat test, 1 Goodwin, in southeastern Kimball County, southwestern Nebraska. Location is in the C SE SE 9-13n-54w.

Atkins & Pannell, Shreveport, is drilling a shallow Nacatoch sand test for Stephens Production Co. at a wildcat location, 1-A Wesson, in the NWc NE SE SW 3-15s-19w, 2 miles east of the Curry field, Ouachita County, southern Arkansas.

Jet Drilling Co., Inc., Wichita, Kans., has moved a rig to a wildcat location northeast of Fleming, eastern Logan County, Colorado, where it will drill for H. E. Zoller, one of its owners. The test, 1 Goddard, C NE NW 21-9n-48w, is the first for Zoller in the Denver-Julesburg basin.

Brown & Tomer Drilling Co., Tulsa, is starting a wildcat test 3 miles northwest of Melvern, in Osage County, eastern Kansas. The test, 1 Vanderslice, located in the NW NW SW 31-17s-16s, is being put down on a contract with L. E. Smith and L. G. Cameron of Shreveport, La.

ACTIVE ROTARY RIGS*

(United States and Western Canada)

Area—	Week ended 3-3-52	Change week ended 2-25-52	Change week ended 3-5-51
Gulf Coast	584	— 5	+ 77
N. & W. Tex.-N. M.	1,012	—25	+223
Ark.-N. La.-E. Tex.	152	— 6	+ 24
Oklahoma	311	—25	+ 32
Kansas-S. Nebraska	180	+13	+ 55
Illinois-Eastern	97	+14	+ 74
Rocky Mountains	158	+ 1	+ 50
Pacific Coast	170	— 3	+ 32
Total U. S.	2,664	—36	+567
Western Canada	181	+ 2	+ 76
Total	2,845	—34	+643

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States and the North and West Texas-New Mexico and Oklahoma-Kansas areas are shown on pages 176 and 177.

R. W. Rine Drilling Co., Wichita, Kans., has contracted to drill a rank wildcat test for Emby Kaye of Tulsa at 1 Goshorn, SE SE SE 31-4n-22eCM, western Beaver County, Oklahoma Panhandle. Contract is for 6,300 ft. Location is about 12 miles south of discovery well recently drilled by Kaye.

Slusser Drilling Co., Marion, Kans., has a rig working on a wildcat location 3 miles northeast of Marion, in Marion County, Kansas, where it is drilling on a contract for J. P. Gaty at 1 Vogel, SE SE NE 9-19-4e.

Greatest Name in Cable Tools:
ACME
TRUSTWORTHY SINCE 1900
Over a Half-Century's Foundation of Acme Specialized Experience in Cable Tools IS Your Constant Assurance of Their TRUSTWORTHY Field Service.
Write for Catalog and Prices
ACME FISHING TOOL CO.
PARKERSBURG W. VA.
Export Office:
19 Rector St., New York 6, N.Y.

Standco
NO SMOKE
STANDCO BRAKE LINING
Stands the gaff and gets the job done without scoring brake rims. See pages 3608-3613, Composite Catalog.
Standco Brake Lining Co.
HOUSTON

HENRY H. PARIS DISTRIBUTOR Inc.

Manufacturer's Agent - Oil Well and Refinery Supplies

P. O. BOX 932 — 1125 ROTHWELL ST.

HOUSTON, TEXAS

Agent and Distributor for the following Nationally Known Manufacturers:

W. C. NORRIS MANUFACTURER, INC.
Tulsa, Oklahoma
Quality Pumping Equipment, Swage Nipples, Bull Plugs, Welding Fittings, etc.

WHEELING MACHINE PRODUCTS CO.
Wheeling, West Virginia
XL Steel Pipe Couplings for OIL COUNTRY TUBULAR PRODUCTS.

THE OHIO INJECTOR COMPANY
Wadsworth, Ohio
OIC VALVES Bronze, Iron, Cast and Forged Steel for all purposes.

HARRISBURG STEEL CORPORATION
Harrisburg, Pennsylvania
Forged Steel Flanges and Seamless Casing Couplings.

DRESSER MANUFACTURING DIV.
Bradford, Pa.
Seamless Welding Fittings.

VOLCANO BURNER COMPANY
Houston, Texas
Volcano Superior and Gulf States All Steel Gas Burners for OIL COUNTRY BOILERS.

OIL STATES EQUIPMENT COMPANY
Houston, Texas
OSECO Silvertop Fusible Plugs with renewable inserts for all types Oil COUNTRY BOILERS.

WESTERN SAFETY BARREL STAND
Houston, Texas
Stand lifts, holds, tilts 55 gal. barrels. Prevents spillage—easily loaded.

STEEL FORGING, Inc.
Shreveport, La.
Weld Saddles and Weld Sleeves.

GLOBE MACHINE & NIPPLE CO.
Houston, Texas
Arrow Brand Pipe Nipples—All Kinds.

HIGH COSTS For Pump Repairs and Well Pulling

For Rod or Tubing Pumps

Due to Pump Trouble

ARE OBSOLETE

Save **UP TO 80%**
UP TO $2500.00

per year on a SINGLE well

And it may not cost you a cent . . . for in many cases the MARTIN PLUNGER costs no more than the replacement of your present plunger. MARTIN CAGES, with their long life, synthetic rubber ball guides, protect balls and seats and increase savings. Ask almost anyone around Freer or Smackover, or Oklahoma City, or wherever hard pumping conditions are found.

Sold thru your supply company.

Field representatives:

E. W. Brockman, Tel. 9-3444, Oklahoma City
Don C. Davis, Tel. Wilson 8055, Ft. Worth
Tom Hulett, Tel. 3-4545, El Dorado, Ark.
L. K. Martin, Tel. 2-5317, Corpus Christi
J. L. Davis, Tel. MOhawk 4891, Houston

JOHN N. MARTIN
MANUFACTURER

9 W. Brady St., Tulsa, Okla. Tel. 4-9415

JUSTRITE

SAFETY LIGHTS for SAFETY FIRST!
for use in hazardous locations

JUSTRITE ALL PURPOSE SAFETY LANTERN

Twin bulb design. Emergency bulb instantly available. Points in any direction. Strong spot beam, plus light in all directions. Used lantern battery. Clear globe protected by wire frame. Safety kick-out bulb sockets. $7.25 less batteries.

Model 2144-5

Model 2146-5
Twin bulb design. Can be switched instantly for flashing or steady light. $9.80 less batteries. Both models are approved by Underwriters Lab., Inc., for Class 1, Group D hazardous locations; U. S. Bureau of Mines; and U. S. Coast Guard Merchant Marine technical division.

SAFETY FLASHLIGHT
FOCUSING — SELF STANDING

Three cell case is more compact than most two cell lights. Bright (1,500 foot) focusing light. Shock resistant case. Spark proof. Completely insulated. $4.00 less batteries. Underwriters Lab. approved for use in all Group D, Class 1, hazardous locations.

Model 1717-5

Order from your jobber.

FREE CATALOG
Write Dept. OGJ

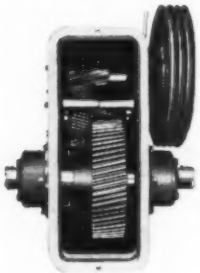
JUSTRITE MANUFACTURING CO.

2061 N. Southport Ave.
CHICAGO 14, ILL.

Only ALTEN PRE-TESTED PUMPING UNITS HAVE ALL THESE BENEFITS

If you are among those oil producers who feel all pumping units are alike, we invite you to make your own comparison. It will show that Alten units:

- ☆ Give longer strokes
- ☆ Have higher gear reducer ratings
- ☆ Are built with better gears



YOU GET THESE ADVANTAGES WITH ALTEN HELICAL GEARS:

EXTREMELY ACCURATE GEAR TEETH
Continuous direction of hob results in cutting accuracy beyond that obtainable from the shaper process which produces herringbone gears.

REDUCED SHOCK LOAD
Impact or backlash loads are 10 to 20% lower than those on herringbone gears because Helix angles are 50% lower.

MAINTAIN PERFECT TOOTH PROFILE
Because Helical Gears have no unflexing centers, stress is evenly distributed over entire face of gear teeth. Tooth profiles are permanently retained.

FLAME HARDENED TEETH
Gears are precision cut from finest alloy steel and shaved for perfect profile then flame hardened for highest surface hardness obtainable.

ALTEN
Foundry & Machine Works, Inc.
LANCASTER, OHIO

Exploration and Drilling

From Williston to the Rio Grande

THE Rocky Mountain oil province is bigger than Texas, if that's possible. It extends from the Williston basin of North Dakota to the Rio Grande River at El Paso, Tex.; from the Great basin of western Utah to the Julesburg basin of Southwest Nebraska. To be sure there's basement rock at the surface throughout large areas within this big province and lots of area where the sedimentary section is too thin to be attractive to oil searchers, but there are also many deep sedimentary basins to challenge geologists.

Dorsey Hager found that the production of oil in the United States has climbed in the same ratio as the increase in the number of geologists. If this ratio continues to hold true, the Rocky Mountain province is soon to see a rapid increase in productive capacity because geologists are pouring into oil centers of the Rockies. Major companies are building up their Rocky Mountain staffs, independent companies are sending in geologists to evaluate their holdings and guide exploratory drilling, consulting geologists are moving into this area of growing activity. At the second annual meeting of the Rocky Mountain Section of the American Association of Petroleum Geologists at Salt Lake City, February 28-29, 750 geologists were expected, more than 1,200 showed up.*

What's the attraction? For one thing the Rockies offer a place to go where there is such a thing as attractive unleased land, even though that's vanishing rapidly. Another is the ever-increasing evidence that big oil will be found in sparsely tested areas.

The Williston basin ranks highest in general interest at the present time. This basin offers a variety of traps in numerous porous zones in carbonate and clastic rocks at various depths. An operator does not need to have the million dollars it might take to drill a wildcat in the deep part of the Williston basin, which lies to the north of the currently developing Nesson anticline, but can back off from this center and call his depth. The area just inside the feather edge of Mississippian rocks looks especially inviting.

All-out development of the Julesburg basin is still hampered by a transportation bottleneck which will be relieved somewhat, but not entirely, by the completion of the Platte pipe line this year. This comparatively new producing area is already seeing the beginning of a deep-drilling stage. Several granite tests are scheduled for this year to check potentialities below the producing Cretaceous sands.

Over in the Uinta basin, looked upon as offering Utah's best hope for climbing to second place in the list of production by Rocky Mountain states, drilling, production, and transportation problems are being studied. That the basal Green River sands and fractured shales are loaded with oil is no longer doubted. (The discovery well of Roosevelt field has produced about 475,000 bbl. of oil and is still good for 500 bbl. daily on subsurface hydraulic pump.) The problems are: (1) How to drill a hole that will tap that oil occurring in fractures, (2) how to handle that oil, which freezes at normal surface temperatures, once it's gotten above ground, and (3) how to transport that oil once a substantial potential is developed. Until satisfactory answers to these problems are found, activity in the Uinta basin is going to be rather modest.

Down in the Four Corners area it's still the San Juan basin that is showing the best results of exploratory drilling. Here the big gas fields continue to expand and no limit to their areal extent has yet been indicated. Discoveries of oil in an Upper Cretaceous-Mancos shale lentil (the Tocito sandstone) and in the Mississippian-Ouray, a widespread porous limestone, indicate that significant oil fields can be expected in this basin where an estimated 500 wells will be drilled in 1952. A significant test near the untested center of the Black Mesa basin is scheduled for this year. In the Paradox basin, a basin outlined by the known extent of the Paradox member of the Pennsylvanian-Hermosa, oil shows in Pennsylvanian, Mississippian, and Devonian rocks have been found at many places to indicate that important discoveries should be forthcoming in this area.

In summary, the potentialities of the Rockies are enormous and it appears that the need for more and more pipe lines out of the area will continue for many, many years to come.

Philip C. Ingalls.

*Abstracts of some of the papers presented at the meeting are on pages 125 and 126.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

PERMIAN BASIN.—Shows of Spraberry oil northwest of the Pegasus field at Sinclair Oil & Gas Co. 4 June Tippett, 2-41-T4S-T&P, has aroused interest in that pay for the entire area, extending southeast to the first Spraberry well on the south edge of the Pegasus field.

OKLAHOMA.—Helmerich & Payne, Inc., are drilling ahead at 8,135 ft. at 1 Britton, C NE NE 28-9n-17w, Washita County. The wildcat is located in the trough trend extending northwest-southeast off the north flank of the Wichita-Amarillo uplift. Recovery on a 2½-hour drill-stem test at 7,978-8,008 ft. was 930 ft. of 43.9°-gravity oil from the Hoxbar.

ROCKY MOUNTAIN AREA.—Deep Well Production is running casing after recovering 590 ft. of 44°-gravity oil on a 1-hour drill-stem test of basal Green River at 1 Lambert, C SW SW 22-8s-16e(SLM), Uintah County, Utah. The Brinkerhoff Drilling Co. 1 Gessell, NW SW SW 14-3n-1w (WRM), East Pilot Butte, Fremont County, Wyoming, wildcat is flowing 150 ft. of 48°-gravity oil daily from the base of the Muddy.

Louisiana-Arkansas

Completion Is Due At Springhill Discovery

SHREVEPORT.—A new Tokio discovery near the Arkansas-Louisiana state line is waiting on official state gage. When the well is officially brought in it will probably be named after the town of Springhill. The wildcat is the L. L. Robinson et al 1 Kilpatrick in 6-23n-10w, Webster Parish.

Present flow is 84 per cent oil of 39.6° gravity. Official state test was delayed while operators squeeze and cement off water sands around casing. Flow came from perforations between 3,104-10 ft. in the Tokio. The flow of 8 bbl. of fluid hourly was originally cut by 30 per cent basic sediment and water, but after wildcat cleaned itself into pits the amount of mud and water was cut to 16 per cent.

The Tokio play in the Springhill area was opened recently by Shell Oil Co. at 1 Browning-Burns Unit, 12-20s-23w, Columbia County, Arkansas, just across the state line from the 1 Kilpatrick. Shell et al recovered 2,486 ft. of 38°-gravity oil with no water on a 30-minute drill-stem test between 3,108-16 ft. Contract depth for the 1 Browning-Burns Unit is in the Smackover.

Several other wildcats have been spotted in this area recently. V. L. Dixon 1 Harrison is reported to be drilling ahead at 1,800 ft., and the Robinson 2 Kilpatrick is reported to have spudded. John B. Stephens has staked location at 1 Melvin Boucher, 300 ft. west and 70 ft. south of NEc 11-23n-11w, within the town of Springhill. Tokio will be tested at 3,500 ft. The Robinson 2 Kilpatrick is 660 ft. east of indicated discovery well. Dixon is drilling southwest of the strike. G. A. Lindsey is bringing in derrick for 1 Curtis D. Martin, northwest of the Dixon 1 Harrison. F. F. Robinson has staked location for 1 Fee in 2-23n-11w, 1½ miles west of the new discovery. Production will be sought in Tokio at 3,500 ft.

Gulf Refining Co. A-1 Colfax Lumber and Creosote Co. NW NW 36-8n-5w, Grant Parish Wilcox discovery, has been completed from perforations between 3,447-59 ft. and shut-in waiting for pipeline connection. Wildcat flowed 1,500 M.c.f. of gas daily through ¼-in. choke. The discovery has been called Wetzlar.

LOUISIANA SUCCESSFUL WILDCAT

Grant Parish: Gulf Refining Co. A-1 Colfax Lumber & Creosote Co., 330 ft. S and W NEc NW NW 36-8n-5w, flowed 1,500 million cu. ft. of gas from Wilcox between 3,447-59 ft., TD 4,013 ft. (discovery called Wetzlar)

LOUISIANA WILDCAT FAILURE

Bossier Parish: D. E. Vasser et al 1 Wafer, 540 ft. N and 660 ft. W SEc 11-18n-12w, dry, TD 5,663 ft.

THIS AD SPEAKS FOR ITSELF . . . .

HELMERICH & PAYNE, INC.

FIRST NATIONAL BUILDING - TULSA 3, OKLAHOMA

February 1st, 1952

Ben F. Kelley Co., Inc.
18 South Madison
Tulsa 3, Oklahoma

Attention Mr. B. F. Kelley, President

Gentlemen:

This has to do with two accidents in our drilling operations in West Texas and especially in regard to the operations of KelCo Air Operated Power Slips.

During drilling operations at a well in Midland County, Pegasus Field, on December 13, 1950, with a total hole depth of 10,962' the driller was going in the hole with approximately 9,000' of 3-1/2" drill pipe and 21 5-1/4" drill collars when the fuse that controls the electric brake blew out. The driller tried to control the load with the manual brake but was unable to hold the pipe load. This allowed the drum to run away causing the elevators and drill pipe to fall almost the full length of the stand and to drop on the lifter ring of the KelCo Slips. This caused the slips to sit on the pipe preventing the dropping of the drill pipe and drill collars to the bottom of the hole. After the accident, we discovered that the lifting ring and lifting arm were slightly bent requiring a very short repair job in the shop. The total cost amounted to about $60.00.

On January 14, 1952, a second accident occurred where KelCo Slips were being used at a well in Ector County, Sweetie Peck Field, and with a total hole depth of 10,672'. The driller was coming out of the hole with 8,800' of 4-1/2" drill pipe and 23 6" drill collars with the elevator approximately 12' above the rotary table when a sheave in the travelling block split. This cut the drilling line and caused the pipe and drill collars to fall with the elevators hitting the lifting ring of the KelCo Slips causing the slips to sit on the drill pipe, again preventing the pipe and drill collars from going to the bottom of the hole.

The catching of the pipe by your KelCo Slips in each of these cases prevented a very expensive fishing job. In the latter accident the expense of placing the slips back into operation was less than a $100.00. There is no way for us to estimate the cost of either of these accidents had the drill pipe and drill collars gone to the bottom of the hole; however, if it had not been for the KelCo Slips, these would have been very expensive fishing jobs.

Yours truly,

HELMERICH & PAYNE, INC.

Herman Aweas

KELCO BEN F. KELLEY CO., Inc.
TULSA, OKLAHOMA

Eastern Texas

Wood County Wildcat Reports Good Recovery

DALLAS.—Sun Oil Co. 1 R. H. McCrary, sub-Clarksville discovery 4½ miles southwest of Winnsboro in Wood County, was the center of interest for that area. Drill-stem test at 4,398-4,412 ft. recovered 2,300 ft. of oil in 45 minutes and at 4,413-20 ft. a 40-minute test developed 2,100 ft. of oil.

Operators perforated casing at 4,408-18 ft. and made production test which gaged 215 bbl. of oil in 22 hours. Flowing pressures and choke size were not reported, but bottom-hole flowing pressures on the drill-stem tests were around 975 psi.

New work reported included an 8,000-ft. test to be drilled by Hollandsworth Oil Co. in the 1 E. S. Fox, on a 50-acre lease in the William Fisher Survey. Location is southeast of Paluxy pay at Pine Mills and east of the Earl Lee Woodbine field.

In Fannin County, Callery & Hurt 1 R. G. Robinson, wildcat in the S. M. Rainer Survey, was drilling at 4,263 ft. in hard sand, with no shows confirmed.

New exploration work for Grayson County included Pan American Oil Co. 1 Umphress, projected to 8,000 ft. Location is 2 miles northwest of the town of Pilot Grove on a block of 193 acres in the Ely Jones Survey, A-632.

Hollandsworth Oil Co. 4 Frank Davis, outpost test to the Woodlawn test in the Thomas Gray Survey, was waiting on potential after treating with acid at 6,567-6,636 ft.

Zephyr Oil Co. 1 E. S. Bogue, wildcat 7 miles west of Waskom, flowed an estimated 203,000 cu. ft. of gas a day plus 10-15 bbl. of distillate, through ¼-in. choke from perforation sat 6,140-65 ft. and as waiting on potential.

EAST TEXAS (DISTRICTS 5 AND 6) SUCCESSFUL WILDCATS

Wood County: Trans-Texas Drilling Co. 1 Sallie L. Olds, J. Ramsey Sur., 4½ mi. NE Quitman, TD 4,540 ft., elev. 456 ft., pay 4,512 ft., IP pumped 146 bbl. oil.

EAST TEXAS (DISTRICTS 5 AND 6)

EAST TEXAS (DISTRICTS 5 AND 6) WILDCAT FAILURES

Cherokee County: National Associated Petroleum Co. 1 I. J. Shankels, R. P. Brown Sur., dry, TD 8,890 ft., Paluxy 6,785 ft.

V. Whiteley Drilling Co. 1 J. A. Musick, M. McKay Sur., dry, TD 4,482 ft., Woodbine 4,316 ft.

Harrison County: Hollandsworth Oil Co. 1 J. R. Cullen, J. D. Pinson Sur., dry, TD 7,020 ft.

Lamar County: Sussex Oil Co. 1 R. L.

Lewis, Wm. Ingram Sur., dry, TD 2,800 ft.

Sabine County: Humble Oil & Refining Co. 1-H. Pickering, J. W. Brightman Sur., dry, TD 6,600 ft.

Van Zandt County: H. D. McDonald 1 W. G. Curtis, W. C. Faysoux Sur., dry, TD 5,966 ft.

Permian Basin

Spraberry Oil Shows Found Northwest of Pegasus

MIDLAND.—Shows of Spraberry oil northwest of the Pegasus field at Sinclair Oil & Gas Co. 4 June Tippett, 2-41-T4S-T&P, has aroused interest in that pay for the entire area, extending southeast to the first Spraberry well on the south edge of the Pegasus field.

Sinclair 4 Tippett, in a Pennsylvania area, found salt water in that formation in drilling and testing to 10,900 ft. After treating in the Spraberry through perforations at 8,422-25 ft. it was swabbing around 1½ bbl. of new oil on each trip of the swab.

First Spraberry oil in the area was Republic Natural Gas Co. 2 American Republics Corp., a depleted Ellenburger well in 40-6-T5S-T&P, Upton County, which made 38 bbl. of oil a day, plus some water, from the upper Spraberry at 7,660-7,865 ft.

Lower Spraberry wells in northwest Reagan County brought the Weiner-Floyd and Aldwell areas closer together. Fred W. Shield 3 J. A. Robey in 19-G-L&SV completed for 484 bbl. of 43°-gravity oil a day from open hole at 7,418-7,520 ft. Top of pay was 7,440 ft., on elevation of 2,667 ft. It is an east extension.

Northeast of the original Aldwell field, Humble Oil & Refining Co. 3 Eva Woods pumped 66 bbl. of oil a day on completion test from perforations at 6,780-6,830 ft. and 7,665-7,707 ft.

Link well in the area was Sun Oil Co. 3 Lottie Jalonick, in 9-C-L&SV, which completed for 111 bbl. of oil a day from pay at 7,726-99 ft.

Magnolia Petroleum Co. 1 University, Andrews County Devonian discovery, recovered 30 ft. of lime and dolomite having some porosity and some oil stains on a core from 12,630-60 ft. Operators were reaming the core hole and were to core ahead.

The Texas Co. has staked location for a Devonian exploration 5½ miles north of Continental Oil Co. 1-8 University and 7½ miles northeast of Magnolia 1 University. Texas Co.'s new well will be the 1-Z University in 22-6-University Lands.

Gulf Oil Corp. 1-NNN University, Andrews County Ellenburger discovery, completed for 1,015 bbl. of oil a day through ¼-in. choke from pay at 12,520-75 ft. Its potential was based on an average from two 6-hour tests.

Continental 1-8 University developed 60 ft. of drilling fluid with no shows on a 1-hour drill-stem test at 8,960-9,030 ft. and was drilling ahead below 9,223 ft.

In Ector County, V. A. Brill 1 Sallie Ratliff developed 3,500 ft. of oil and mud, said to be mostly oil, on a drill-stem test from 10,821-49 ft. in the Bend conglomerate of the Pennsylvanian. A previous test at 10,700-36 ft. developed 360 ft. of 37°-gravity oil.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Andrews County: Magnolia Petroleum Co. 1 Bertha Nolley, 7-214-Gaines CSL, extension to Nolley discovery, TD 9,270 ft., elev. 3,157 ft., perforated 8,129-59 ft., IP pumped 118 bbl. 30°-gravity oil.

Pecos County: Callery & Hurt, Inc., 1 Iowa Realty Trust, 23-10-H&GN, TD 6,237 ft., elev. 2,465 ft., Devonian 5,658 ft., completed as shut-in gas well.

Reagan County: Humble Oil & Refining Co. 1-J. Sawyer Cattle Co., 14-A-R. W. McGraw Sur., TD 6,744 ft., Spraberry pay 5,724 ft., IP pumped 70 bbl. 38°-gravity oil.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Garza County: Priggs-Bailey & Shatto 1 Ada Webb, Sec. 1,241, HE&WT, dry, TD 650 ft.

Glasscock County: Plymouth Oil Co. 2 S. C. Currie, 28-32-T4S-T&P, dry, TD 2,993 ft.

Pecos County: Brown & Thorp Drilling Co. 1 G. R. White, 55-194-GC&SF, dry, TD 3,514 ft.

Richardson & Bass 1 Barron Kidd, 36-9-H&GN, dry, TD 5,443 ft., elev. 2,353 ft., Ellenburger 5,413 ft.

David T. Roche 1 Adams, 4-134-T&STL, dry, TD 3,542 ft.

Sinclair Oil & Gas Co. 1 University-Pecos, 32-24-University, dry, TD 5,064 ft.

James E. Smith 1 M. M. Holmes, 48-1-H&GN, dry, TD 1,367 ft.

Standard Oil Co. of Texas 1-A Claude Owens, 2-C4-GC&SF, dry, TD 2,880 ft.

Stanolind Oil & Gas Co. 1-A State, 26-3-T&P, dry, TD 3,542 ft., dolomite 1,456 ft.

Reagan County: J. C. Barnes 1 University, 31-58-University, dry, TD 10,910 ft., elev. 2,606 ft., Spraberry 5,700 ft., lower Spraberry 6,565 ft., Wolfcamp 8,130 ft.

Mid-Continent Petroleum Corp. 1 Ella Holt, 110-2-T&P, dry, TD 7,788 ft., elev. 2,636 ft., Dean 6,815 ft., Wolfcamp 7,488 ft.

Runnels County: Sunray Oil Co. 1 Arendale, Blk. 523, BBB&C, dry, TD 4,267 ft., Capps 3,667 ft., Ellenburger 4,245 ft.

Sutton County: Fullerton Oil Co. 1 Lea Allison, 65-B-HE&WT, dry, TD 5,870 ft., elev. 2,306 ft., Strawn 5,323 ft., Ellenburger 6,590 ft.

Tom Green County: Rutter, Wilbanks & Sergent 1 H. C. White, Sec. 656, German Emigration Co. Sur., dry, TD 437 ft.

The Texas Co. 2 Sam S. Kelley, German Emigration Co. Sur. 870, dry, TD 562 ft.

The Texas Co. 1 J. P. Lee, German Emigration Lands Sur. 664, dry, TD 495 ft.

Ward County: Southern Production Co. 1 Lee H. Madden, 25-33-H&TC, dry, TD 5,151 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Collingsworth County: Laan-Tex Oil Co. 1 Bailey, 49-11-H&GN, dry, 5,516 ft., elev. 1,980 ft., dolomite 2,775 ft., granite wash 4,242 ft.

SOUTHEASTERN NEW MEXICO

The West Dollarhide-Ellenburger field of Lea County received its first Fusselman limestone producer at Skelly Oil Co. 3-J Mexico, which had sulfur water with some oil in the Ellenburger at 10,280-92 ft. Operators plugged back to 8,790 ft. and completed for 1,996 bbl. of oil a day from pay at 8,710-40 ft.

In the Denton Devonian field, Skelly 4-F Mexico finished for a daily potential of 1,937 bbl. of oil a day through ¾-in. choke from open-hole pay at 12,314-550 ft.

Wilshire Oil Co. 1 Townsend, deep wildcat in 41-16s-35e, recovered its water blanket and 360 ft. of gas-cut mud on a 2-hour test in the Devonian at 13,370-481 ft., and was to core ahead and test.

Humble Oil & Refining Co. 1 Federal-Elliott, wildcat in 1-16s-34e, was drilling ahead at 13,736 ft.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Amon C. Carter 1-D Hill Federal, 34-23s-37e. TD 7,484 ft., elev. 3,273 ft., Devonian 7,160 ft., pay 7,150 ft., IP 823 bbl. 43°-gravity oil, ½-in. choke, TP 900 psi., GOR 1,890 cu. ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Chaves County: DeKalb Agricultural Association 1-X J. P. White, 28-10s-29e, dry, TD 9,135 ft., elev. 3,885 ft., Wolfcamp 6,830 ft., Mississippian 8,548 ft., Devonian 9,088 ft.

SANDED UP STRIPPING JOBS CAN BE MADE EASIER

BAIRD
SAFETY WHEEL WRENCH

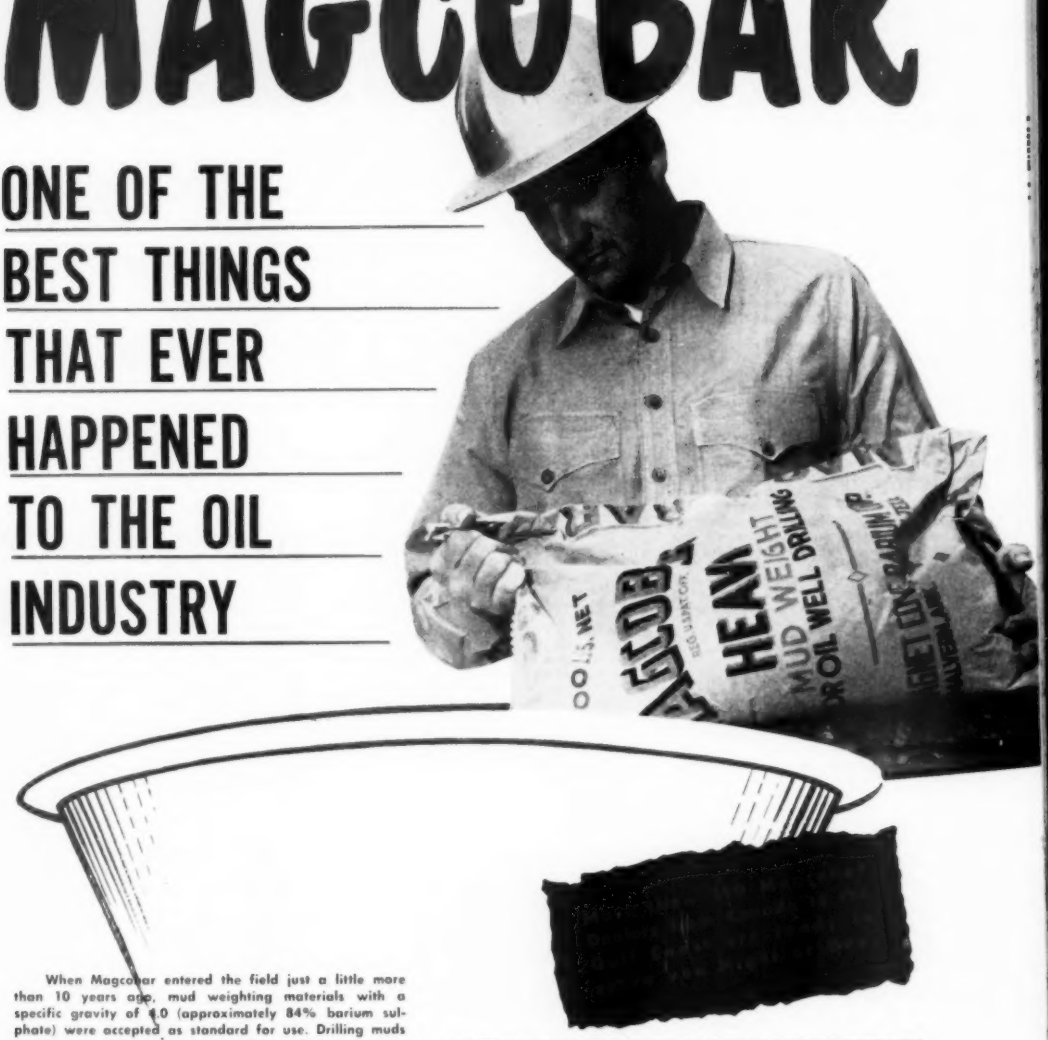
Stripping sucker rods on a "sanded up" job with a Baird Safety Wheel Wrench saves time and perhaps an injury. Designed for safe operation, this wheel wrench cannot slip since the hub assembly is securely locked around the rod. Baird Safety Wheel Wrenches are available at your nearest supply store.

BAIRD MFG. CO.
P.O. BOX 380-TULSA

PERRAULT
FIBER-CAST
THERMO-SET PLASTIC PIPE
REINFORCED WITH GLASS FIBERS
FOR
THE OIL INDUSTRY
THE GAS INDUSTRY
FRESH WATER SYSTEMS
SALT WATER SYSTEMS
"Everything for the Pipeliner"
★
PERRAULT Brothers
1130 NO. BOSTON,
TULSA, OKLA. • 5-1103
Export Office:
30 ROCKEFELLER PLAZA
NEW YORK, N. Y.
CIRCLE 6-6260

MAGCOBAR

ONE OF THE BEST THINGS THAT EVER HAPPENED TO THE OIL INDUSTRY



When Magcobar entered the field just a little more than 10 years ago, mud weighting materials with a specific gravity of 4.0 (approximately 84% barium sulphate) were accepted as standard for use. Drilling muds weighing over 15 pounds per gallon with low viscosity seemed next to impossible.

Today, the standard for mud weighting materials is a specific gravity of 4.25 to 4.35 (approximately 95% barium sulphate). Drilling muds weighing up to 19 pounds per gallon with low viscosity are used in many heavy pressure areas.

Yes, drilling mud quality is much higher today because Magcobar developed and pioneered the first commercial production of barite beneficiated by the flotation process in 1940. This method produced barite that was not only higher quality, but also very uniform. Furthermore, by this process, low grade barite ores could be turned into high grade products . . . and this alone added many millions of tons of reserves which were made available to the oil industry for drilling mud.

Since those early days, the oil industry's wide acceptance of Magcobar's high quality products, good service and fair and reasonable prices has enabled Magcobar to be of even greater service to the only industry it serves.

So when you need dependable drilling mud service, call Magcobar first. Magcobar is one of the best things that ever happened to the oil industry.

Magcobar

Complete

DRILLING MUD SERVICE

DEALER

MAGCOBAR • MAGCOGEL • HIGH YIELD • MAGCO-FIBER • XACT CLAY • FIBER SEAL • LEATHER-FLOC • FORM-A-PLUG • CELL-O-SEAL SALT GEL • MAGCO-PHOS • RED OX • MAGCO-MICA • TANNATHIN JEL-OIL MUD • JEL-OIL "E" • "E" CONCENTRATE • NOHEEVE MY-LO-JEL PRESERVATIVE • QUEBRACHO • CHEMICALS

California

Fruitvale Field Continues To Expand in Areal Extent

LOS ANGELES.—After undergoing development for almost 24 years, the Fruitvale field on the northwest edge of Bakersfield continues to expand in areal extent. In the past two years more than 500 acres have been added to its productive limits. Addition development is under way at extension areas on the north and southwest flanks which may be linked to the main field.

About ¾ mile southwest of the field proper York & Assoc. completed 1 Duke in SW NW 28-29s-27e as a link well between two last year extensioners. It was completed flowing 160 bbl. daily in the Kernco through perforations at 4,320-60 ft.

About ¾ mile north of the field, and over ¼ mile northwest of its 1 Ansolabehere extensioner completed last December, Norbel Oil Co. ran into difficulty in completing 1-A K.C.L. in NW NW Sec. 14. After drilling to 2,894 ft. and finding good oil shows in the Fairhaven, 7-in. casing was set at 2,860 ft. During testing operations the casing collapsed, however, and at last reports the operator was preparing to plug back to redrill.

In the northern counties oil area a wildcat attracting attention was that of John Baldwin in Contra Costa County. The test, 1 Baldwin-Soite in 17-2n-1w and 7 mile east of Martinez, had 7-in. casing set at 5,029 ft., total depth, with top of the Capay called at 4,000 ft. The wildcat was drilled to 5,488 ft. before plugging back and redrilling to the new total depth.

On the northwest flank of Belgian Anticline, in the vicinity of Ohio Oil Co. Tulare extensioner completed last December, drilling was being increased. About ½ mile northwest of the Ohio well, Union Oil Co. was completing 84-24 C.C. M.O. in the Oceanic sand. Located in SE NE 24-30s-21e the potential extensioner topped the sand at 6,153 ft. and was drilled to 6,225 ft. where 7-in. casing was cemented.

A location south of Ohio 1 Tulare Fee, Pacific Western Oil Co. was preparing to drill 1 Midway & McKittrick while about 1,000 ft. east of the extensioner Ohio was rigging 2 Tulare Fee. West offset to 1 Tulare was completed late in February, flowing 11,000 M.c.f. of gas daily from the Point of Rocks at 6,963 ft. total depth.

A New Kern County wildcat staked was Independent Exploration Co. 1 Signal-U.S.L. The test will be drilled in 30-28s-20e, in the Stone Corral area about 1½ miles southwest of Bacon Hills field. In Kings County and 1½ miles southeast of the Hanford field, H. S. Sankey staked location in 6-19s-23e for 1 Rockhold.

In Los Angeles County, Ohio Oil Co. was preparing location for a wildcat 1½ miles southeast of the Oak Canyon field and 3 miles west of Honor Rancho production. The test will be its 1 Douglas in SE NE 4-4n-17w.

At its link test between the Honor Rancho and Castaic Hills field, The Texas Co. was below 4,260 ft. at 10 Honor Rancho-1. Outcome of this wildcat will do much to show whether or not the two fields will link. Location of the test is in SE SE 36-5n-17w.

CALIFORNIA SUCCESSFUL WILDCATS

Kern County, new shallow zone discovery in Devils Den field: Gilliland Oil Co. & C. O. Davis 3 Strode, SE NE 15-25s-18e, flowed 24 bbl. per day through perforations at 1,688-1,720 ft., 5 per cent cut. Point of Rocks 1,429 ft. TD 3,355 ft., elev. 641 ft.

½ mile west extension to Kern River field: Standard Oil Co. of Calif. 76 KCL 29, NE SE 7-29s-28e, pumped 8 bbl. per day oil through perforations at 1,695-1,748 ft., TD 2,000 ft., elev. 433 ft.

New pool discovery ½ mile east of Sharktooth area: Pacific Supply Cooperative 1 Bishop, NE SW 24-28s-28e, pumped 7 bbl. per day through perforations at 2,240-2,267 ft., 14°-gravity crude, 20 per cent cut, Pyramid Hills sand 2,240 ft., Vedder sand 2,329 ft., TD 2,600 ft., elev. 942 ft.

Monterey County, ¼ mile north extension to San Ardo field: Superior Oil Co. 1 San Ardo-Gov't., 33-22s-10e, pumped 54 bbl. per day through perforations at 2,289-2,360 ft., 13.7°-gravity crude, 8 per cent cut, Aurignac sand 2,285 ft., TD 2,360 ft., elev. 446 ft.

CALIFORNIA WILDCAT FAILURES

Fresno County, Camden area: B. B. Breckenridge 1 Foreman, 31-16s-20e, dry, Kreyenhagen 6,700 ft., Domengine 7,040-7,063 ft., Creteceous 7,240 ft. TD 7,308 ft., elev. 239 ft.

Kern County, Race Track Hill area: Trico Oil & Gas Co. 1 Barlow, 26-29s-29e, dry, Olcese 3,772 ft. TD 4,910 ft., elev. 927 ft.

Rosedale area: E. H. Jones & H. R. Pauley 1 Froehlich, 26-29s-26e, dry, TD 6,500 ft., elev. 361 ft.

Tejon area: E. B. Hall & Co. 64-11 "Well", 11-10n-19w, dry, TD 3,106 ft., elev. 1,060 ft.

Temblor area: Ferguson & Bosworth 1 Harris, 31-29s-21e, dry, TD 3,943 ft.

Buena Vista area: Standard Oil Co. of California 425 McNee, 36-31s-23e, dry, TD 4,560 ft., elev. 758 ft.

Devils Den area: Lee Clayton 1 "Well", 2-26s-18e, dry, TD 440 ft.

Salt Creek area: Beloil Corp., Ltd. 2 Bacon Hills, 12-29s-20e, dry, TD 535 ft., elev. 1,130 ft.

Tunis Creek area: Reserve Oil & Gas Co. 15-23 "Well", 28-11n-18w, dry, TD 1,773 ft., elev. 805 ft.

Los Angeles County, Bouquet Canyon area: The Texas Co. 1 Bonelli, 13-4n-16w, dry, TD 1,502 ft., elev. 1,265 ft.

VERNON

"Fluid Sealed"

STUFFING BOXES

Here is one of the most efficient and economical stuffing boxes ever offered to the oil industry. Its long life and low maintenance costs mean substantial savings for the user. Vernon "Fluid Sealed" Stuffing Boxes incorporate a fluid seal principle whereby fluid pressure from the well is directed within a moulded packing element causing it to expand and seal off around the polished rod. All inter-parts which might contact the polished rod are made of soft brass or bronze. Thus, the danger of scoring expensive rods is eliminated.

2 TYPES AVAILABLE

Vernon Stuffing Boxes are available in the standard type or the pack-off type.

Write Today for Illustrated Literature

VERNON TOOL CO., LTD.

1103 MERIDIAN AVE., ALHAMBRA, CAL.

CENTRIFUGAL PUMPS • DESANDERS
VIBRATING SCREENS
PIPE CUTTING PANTOGRAPHS
STEEL VALVES • STUFFING BOXES

You wouldn't drill with a dull bit, so . . .

WHY USE COSTLY INEFFICIENT FORMS TO REPORT YOUR OIL PRODUCTION?

For low-cost, better-designed, immediately-available forms, see the new 1952 designs by

Kraftbilt

GAUGE TICKETS • WELL TEST FORMS • PRODUCTION SUMMARY & AUDIT FORMS • PIPE LINE RUN TICKETS

Your production reporting goes quicker and with less errors on Kraftbilt forms. They are clean, clear, coldly efficient—designed by our experts after consulting numerous oil men. So go the Kraftbilt way. Join the scores of operators who use nothing else.

If you haven't received a copy of Kraftbilt Production Reporting Catalog 152, write . . .

ROSS-MARTIN COMPANY

BOX 800-B • TULSA, OKLAHOMA

Castaic Hills are: George Terry 1 Eskridge, 36-5n-17w, dry, TD 6,012 ft.
Sutter County, Marysville area: Richfield Oil Corp. 1 Butte Comm. A, 9-16n-2e, dry, TD 2,119 ft., elev. 90 ft.
Ventura County, Ojai area: E. H. Andrews 1 Carty, 11-4n-23w, dry, TD 4,445 ft., elev. 742 ft.

South Louisiana

Gas-Distillate Strike Is Due Terrebonne Parish

NEW ORLEANS.—A new gas-distillate discovery is indicated in Terrebonne Parish at Leslie Bowling 1 La Terre, 49-19s-19e, which logged 23 ft. of gas-distillate sand from 10,533-76 ft. and 12 ft. of gas sand from 10,466-80 ft. The wildcat had an original contract depth of 12,000 ft., however, operator set 7-in. casing to 11,534 ft. and is preparing to drill ahead on a new 13,500 ft. contract.

Humble Oil & Refining Co. has completed its confirmation test to Bayou Jean La Croix field, Terrebonne Parish. The well 1 LaTerre Company "D", 5-20s-20e, flowed 142 bbl. of 37.7°-gravity oil daily from perforations at 12,526-31 ft. Gage was made through 8/64-in. choke with 2,100 psi. pressure on the tubing. This well is ⅛ mile south of the discovery well, and previously indicated gas-distillate production at 12,647-63 ft.

Magnolia Petroleum Co. is running liner at its deep Allen Parish venture, 1 Ragley Lumber Co., Liner will be set at total depth of 18,660 ft. Operator indicated that shows of gas were found on mud log at 18,586-660, and while they appear to have doubtful commercial possibilities because of tight formation and low permeability, operators found such pressures at this level that it was believed advisable to make production tests.

Woods Oil & Gas Co. 1 B. R. Slater, wildcat in 6-18s-27e, Plaquemines Parish, has run tubing to test 6 possible pay zones indicated by electric log. Drilled to a depth of 11,337 ft., the well had promising shows on log at 11,015-36 ft., 11,047-92 ft., 11,104-09 ft., 11,156-11,200 ft., 11,200-04 ft. and 11,210-38 ft.

At the south offset to South Pecan Lake discovery well, Cameron Parish, Pan American Production Co. is preparing to test an undisclosed interval above 12,500 ft. at 2 Miami Corp., 9-15s-3w. The venture is reported to have 5 pay sands, and will be completed in a different sand than that found in the discovery well.

Meanwhile, 4 miles west of South Pecan Lake, Pan American has found 40 ft. of gas sand in B-1 Miami Corp., 14-15s-4w. After running log to total depth of 13,514 ft., operators are preparing to test at 12,564-70 ft. where a gas sand was indicated on log. The well has an aggregate of 40 ft. of sand in broken sections between 12,470-12,600 ft.

SOUTH LOUISIANA WILDCAT FAILURES
Acadia Parish: J. M. Flaitz 1 Archille Andrepent, 42-8s-1w, dry, TD 10,515 ft.
Evangeline Parish: Signal Oil Co. 1 A. J. Manuel, 15-5s-2e, dry, TD 11,003 ft.
Vermilion Parish: American General Oil & Gas Corp. 1 O. A. Broussard, 47-12s-4e, dry, TD 7,501 ft.

FOSTER
SAFE
CATHEADS

Air Master Breakout Cathead

Air Spinning Cathead

When we began building catheads over a quarter century ago, personal experience had taught us the importance of designing safety into every detail of our catheads.

For instance, on our air-controlled catheads a quick release valve releases the clutch instantaneously; on spinning catheads the spinning line is *not* hand wrapped; it will not foul and wind up; the driller stays at his position.

On breakout catheads are other special safety features.

Now a new and important safety feature, the Foster Safety Rope Guard, which can be attached to any Foster Friction Cathead, is available. Write for details.

Complete details on our line of catheads for every need are given in the Composite Catalog.

Here are features on both the Air Master Breakout and Air Spinning Catheads: Precise control . . . No adjustments . . . Direct diaphragm actuated . . . Instant disengagement . . . Crawl free drum . . . Fully enclosed . . . Quick change jerkline . . . Peak performance.

PLUS . . . Triple plate clutch on the Air Master Breakout . . . and single plate friction clutch for line pulls up to 12,000 lbs. on the Air Spinning Cathead.

There's a Foster Cathead for Every Need.

SOLD THRU SUPPLY STORES EVERYWHERE

Foster CATHEAD COMPANY
P. O. BOX 1675 WICHITA FALLS, TEXAS
FACTORY REPRESENTATIVES
O. W. Frogge, Casper, Wyo. — Greenhead Service Co., Oklahoma City, Okla. — Tillery & Parks, Odessa, Texas — R. D. Clonnger, Lafayette, La. — R. N. Bear, Los Angeles 15, Cal.

Mississippi

Coring To Continue At Deep Rankin County Wildcat

JACKSON.—Lion Oil Co.'s deep Smackover wildcat in Rankin County, Miss., continues to hold the interest of oil men in the area. Twenty-eight feet of soft, permeable and porous sand has been cored in the venture, 2 Denkmann, 22-7s-4e, between 15,997-16,025 ft. The sand is light grey, medium grained, subangular to round, friable, porous and permeable. No salty taste or hydrogen sulfide odor can be detected in the cores. Coring is to be continued in the well as soon as a small piece of junk is removed from the hole.

Union Producing Co. is still having trouble getting a potential test at 1 J. T. Sanders, 22-15s-6e, gas discovery in Monroe County. Gas flow has been turned into pits and burned. The freezing action of expanding gas has prevented operator from running potential test, and hot water is now being pumped into the annular space between casing and tubing in order to raise wellhead temperatures.

In Wilkinson County, Mississippi, A. Q. Petersen 1 Wallace, 18-2n-1w, encountered 4 ft. of oil shows in a sidewall sample at 8,231-35 ft. in the base of the Wilcox. On 15-minute drill-stem test of this interval, using 1,000 ft. of water cushion and ¼-in. top and bottom chokes, recovery was 1,345 ft. of oil and 1,905 ft. of salt water. Due to the fact that shows were in the top part of a sand with no shale break between the oil saturation and salt water, it is believed that the wildcat will be abandoned.

In the new Pollard field of Escambia County, Alabama, Humble Oil & Refining Co.¼ 1 H. D. Finlay et al, 18-1n-9e, third test for the area, cored the Eutaw at 5,150 ft. with no shows indicated. Drilling was resumed in the venture. The field discovery came in at 5,948 ft., and the second well, Humble Co. 1 Congleton, was abondoned at total depth of 6,492 ft.

In Southern Perry County, Miss., on the north flank of the Wiggins anticline, Continental Oil Co. 1 Board of Supervisors,

16-1s-10w, is drilling below 10,904 ft. This wildcat encountered a slight show of oil in a tight sand at 10,009-14 ft.

MISSISSIPPI WILDCAT FAILURES

Adams County: Sunnyland Contracting Co. et al 1 James E. O'Kelley, 2-5n-2w, dry, TD 7,008 ft.

Hancock County: Sun Oil Co. 1 International-Alexander Grant, 4-9s-16w, dry, TD 11,618 ft.

FLORIDA WILDCAT FAILURE

Hendry County: Humble Oil & Refining Co. 1 Collier Corp. "B", 14-47s-31e, dry, TD 11,794 ft.

Canadian Fields

Another Strike Made In Stettler Region

CALGARY.—Canadian Gulf Oil Co. has made another discovery in the general Stettler region of central Alberta, about 90 miles northeast of Calgary. The interesting well, Gulf 4 Lampert, in the Nevis area about 13 miles west of Stettler Devonian oil wells, struck a large flow of natural gas in the D2 zone of Devonian and gave some evidence of condensate or light crude oil.

The Lampert wildcat, located on LSD 4, 32-38-22w4, has so far reported three drill-stem tests in the D2, and crew is continuing coring and testing operations at approximately 10 ft. intervals. Latest and most encouraging test was run from 5,551-62 ft. for 35 minutes. Natural gas reached the surface in 1 minute and rated a maximum flow of 7,000,000 cu. ft. daily in 20 minutes. Fluid recovery was 2 gals. of condensate. Drill-stem test from 5,547-52 ft. flowed gas in 6 minutes, at maximum rate 428,000 cu. ft. daily, decreasing to 280,000 cu. ft. Valve was open for 1¾ hours, and pipe recovery was 490 ft. of black sulfurous slightly oil-cut mud. First test reported in D2 was run from 5,542-52 ft. for 1½ hours. Natural gas flowed in 5 minutes, at rates between 300,000 and 500,000 cu. ft. daily. Recovery was 1,530 ft. of drilling mud.

Gulf 4 Lampert well contacted top of the D2 Devonian zone at 5,540 ft. or 2,804 ft. subsea (K.B. elevation 2,736 ft.). That horizon will be fully cored and tested preliminary to proceeding in search of the D3 zone.

Three Canadian independents have indicated oil discovery in the lower Cretaceous at their first venture on farmout lands from Socony-Vacuum Exploration Co. in the Duhamel area of central Alberta.

The new oil strike was made at Mill City-Socony on LSD 4, 19-45-21w4, a ¼ mile west of Socony 20-4 Duhamel D3 oil well. The discovery was made during drill-stem test of the Cretaceous interval 4,296-4,309 ft. Natural gas reached the surface 10 minutes after valve was opened, and pipe recovery consisted of 210 ft. of clean crude oil, 60 ft. of drilling mud and 150 ft. of oil-cut salt water. Coring and testing will be continued. The well's other objectives, not as yet entered, are the lower D2 and D3 zones of Devonian.

The team of British American Oil Co., Ltd., and Cities Service Petroleum Co. is finding its first follow-up driller to the Clive D2 Devonian oil discovery highly productive of natural gas. So far the well has discovered natural gas in the Viking sand, and more recently struck a flow of natural gas in the Cretaceous, at a rate slightly higher than the discovery well.

The offset driller is B.A.-Cities Service 2 Clive, on LSD 6, 17-40-24w4, a ¼ mile west of the crude oil discovery well. Initial drill-stem test in the Cretaceous, from 5,438-52 ft. gave a natural gas flow to the surface in 4 minutes, at rate 4,400,000 cu. ft. daily in 70 minutes. Pipe recovery during the 85 minute test was 30 ft. of gas-cut mud. Second test in the Cretaceous, from 5,452-62 ft.

A joint is only as good as its threads. Protect them by preventing galling and seizing, with 'Bestolife Lead Seal Tool Joint and Casing Compound. Permits maximum joint make-up. Gives tighter seals. Standard of the oil country for more than 20 years. Unconditionally guaranteed. Packed in 1¼, 5, 20 and 50 lb. containers. Sold and exported by supply houses throughout the world.

I. H. GRANCELL

1601 E. NADEAU STREET, LOS ANGELES 1, CALIF.

gave a gas flow in 15 minutes, at rate 84,000 cu. ft. daily. Pipe recovery was 40 ft. of mud. Crew will head down for the Devonian objectives upon completion of testing operations in the Cretaceous.

The Clive oil discovery and No. 2 driller are located about 95 miles north-northeast of Calgary and 14 miles northeast of Lacombe.

The three company team of Royalite Oil Co., Ltd., Hudson's Bay Oil & Gas Co., Ltd., and Union Oil Co. of California has found an encouraging showing of medium gravity crude oil plus natural gas and water in the Triassic formation at its wildcat venture in the Chinook Valley area of the Peace River region. The well is being deepened in search of lower objectives.

The encouraging strike was made at H. B.-Union-Royalite 1 Chinook on LSD 16, 24-85-24w5, a northwest Alberta wildcat located about 17 miles northwest of Peace River town. Initial drill-stem test in the Triassic, from 2,687-2,704 ft. gave a recovery of 65 ft. of brown black-gassy oil with gravity around 25° and 450 ft. of brown oil and water emulsion. Second test, from 2,704-20 ft. yielded a gas flow in 5 minutes, at rate 1,000,000 cu. ft. daily in 30 minutes. Two hour pipe recovery was 405 ft. of heavy oil-cut gassy sulfur salt water. Drilling is being continued.

CANADIAN WILDCAT FAILURES

Bailey 1 Buck Lake, LSD 12, 26-45-7w5, TD 10,158 ft.

Imperial 1 Faria LSD 1, 12-110-16w5, TD 3,853 ft.

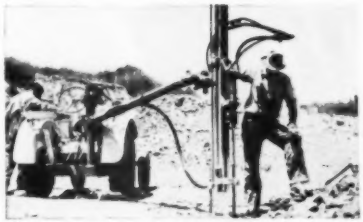
Imperial 9-18 Foley Lake, LSD 9, 16-51-23w4, TD 5,672 ft.

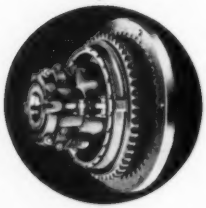
Imperial 8-22 Sawdy, LSD 8, 22-86-9w5, TD 4,981 ft.

Imperial 6-20 Sawdy, LSD 6, 20-68-23w4, TD 4,013 ft.

Golden Spike-Dempsey 1 Hilliard, LSD 7, 20-54-17w4, TD 3,853 ft.

This "Handy Andy" Handles





Many Oil Field Jobs

This LeRoi two-machines-in-one tractor handles compressor, loader, back filler, ditcher, driller and many other jobs in addition to the usual work expected of a utility tractor. Power transmission control, provided by ROCKFORD CLUTCHES, helps make this versatility possible. Let ROCKFORD engineers contribute their ideas to help multiply the uses of your product.

ROCKFORD CLUTCH DIVISION BORG-WARNER
1303 Eighteenth Avenue, Rockford, Illinois, U. S. A.

B-W ENGINEERING MAKES IT WORK

B-W PRODUCTION MAKES IT AVAILABLE

ENGINEERING BULLETIN SENT ON REQUEST

ROCKFORD CLUTCHES

Southwest Texas

New Oil Sand Opened In Bastrop County

CORPUS CHRISTI.—Thomas Jordan has opened a new oil bearing sand at 2 H. N. Bell, second well in a new Bastrop County field 2 miles northwest of Sayerville. From perforations at 2,847-2,920 ft., the well pumped 220 bbl. of 16°-gravity oil daily. The well was drilled to 3,280 ft. and operator set 5½-in. casing on bottom. The Austin was topped at 2,770 ft.; Buda at 2,870 ft.; Georgetown at 3,005 ft. and the Edwards at 3,100 ft.

O. W. Killam 3 J. O. Walker, Webb County discovery, 7 miles southwest of Mirando City, has been potentialed for 75 bbl. of oil daily on pump from the upper Rosenberg at 1,677-87 ft.

Meanwhile, in the same area, Killam 4 J. O. Walker is setting pipe after flowing a spray of oil on drill-stem test of perforations at 1,646-61 ft. Working pressure rose to 525 psi.

In Jim Wells County, Texita Oil Co. 1 W. A. Davis, T&NO Survey, is coring below 3,300 ft. for the Davis sand after recovering oil-cut mud on drill-stem test from the Hollow Tree sand. A 35-minute drill-stem test was conducted at 3,287-3,300 ft., and recovery was oil-cut mud and salt water. Maximum top pressure ranged from 4½ psi. to zero. The well is projected to 4,000 ft.

C. G. Glasscock & Selby Walker 1-B Yturria Land & Livestock, wildcat in Porcion 44, Survey 883, Hidalgo County, has set 5½-in. casing at 4,485 ft. prior to running production tests. The well topped the Sullivan Sand at 4,460 ft. and a drill-stem test at 4,455-85 ft. recovered 60 ft. of gas and distillate-cut mud.

In Aransas Bay, 2½ miles southeast of Rockport, Humble Oil & Refining Co. 1 Aransas Bay-State Tract 190, wildcat, recovered 15 gal. of oil and 4 gal. of gas-cut mud on drill-stem test at 9,240-9,306 ft. Tool was open 20 minutes. The well has 7-in. casing set at 9,240 ft., and at last report, operator was coring below 9,410 ft.

Houston Oil Co. of Texas and American Republics Corp. 1 Temple W. West, basal massive Vicksburg gas-distillate strike in Hidalgo County, is drill-stem testing perforations at 6,048-58 ft. The project is bottomed at 6,704 ft. with 5½-in. casing set at 6,197 ft. The well earlier logged 104 ft. of gas sand. Wildcat is located 4¾ miles east of Samfordyce in Porcions 74 and 75, main canal District 6.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCAT

Duval County: Oil discovery—Ben H. G. Coglin 1 Mae H. King Est. H. H. Garrison Sur. 323, TD 1,751 ft., perf. 1,737-447 1,746-49 ft., IP: 19 bbl. oil per day

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Atascosa County: J. P. Davidson 1 J. T. Pesek, Natascosa Colony Farms Subd. Bl. 26, dry, TD 1,610 ft.

J. D. Hedley 1 Montgomery, I&GN RR Co. Sur. 1,727, dry, TD 3,104 ft.

Texita Oil Co. 1 Pratt, Jesse Pratt Subd. Sec. F, de la Garza Sur. A-277, dry, TD 2,409 ft.

Bexar County: H. A. Pegenkope et al 1 Joe Clutter, S. Hernandez Sur. No. 209, dry, TD 1,237

Dimmitt County: Kirkwood & Morgan 1 Y. C. Strait, I&GN Sur., Sec. 23, dry, TD 5,136 ft.

Duval County: Hammon, Cox & Coates 1 Geronimo Lopes, BS&F Sur., Sec. 730, dry, TD 4,518 ft.

Harris S. Stahl 1 The Duwell Co.-James Dougherty Surf, AB&M Sur. 205, Cert. 1013, dry, TD 2,914 ft.

Frio County: Tri-Mark Oil Co. 1 Federal Royalty Co., Sur. AB&M, A-29, Sec. 5, dry, TD 4,518 ft.

Hidalgo County: Taylor Refining Co. 1 A.

R A GOOD
EMENT JOB
SPECIFY
B and W LATCH-ON CENTRALIZER
with the NEW
KON-KAVE BOW
DROP-FORGED
FROM
FINEST ALL SPRING STEEL
AND
DOU HEAT TREATED
B and W Incorporated
Well Completion Specialists
GULF COAST
P. O. Box 5266
Houston 12, Texas
WE-ntworth 6603
WEST COAST
2545 Cedar Avenue
Long Beach 7, Calif.
Long Beach 4-8366

A. McAllen, Santa Anita Grant, dry, TD 8,040 ft.

Jim Wells County: Houston Natural Gas Corp. 2 Chas. & Lillian Mull, J. Poitevent Sec. 207, A-372, dry, TD 5,558 ft.

Curtis Singleton Drilling Co. 1 Weldon, Stacey & Blake, Dibbrall, Soyars & Gallagher Subd., Blk. 10, dry, TD 5,015 ft.

McMullen County: L. M. Glasco 1 G. A. Lowrance, CCSD&RGNG RR Sur., C. C. Shunway Subd. of Shiner Ranch, dry, TD 7,550 ft.

Newman Bros. Drilling Co. et al 5 South Texas Syndicate AA, BS&F Sur., A-99, Sec. 15, dry, TD 1,513 ft.

Newman Bros. Drilling Co. at al B-14 South Texas Syndicate, E. M. Beall Sur., A-590, dry, TD 4,513 ft.

Nueces County: W. E. Fox 1 H. D. Countiss, Vincente Lopez de Herrara Orig Grant, A-2661, part of the Wright lands, Share 2, dry, TD 6,950 ft.

Starr County: C. G. Glasscock 1-A Guerra, Las Cuevitas Grant, dry, TD 2,068 ft. Falcon-Seaboard Oil Co. 1 Paredes et al, Share 137, Porcion 74, dry, TD 3,012 ft.

North Central Texas

Canyon Strike Completed In Nolan County

WICHITA FALLS.—Mar-Tex Realization Corp. 1 Boothe Estate, northwest Nolan County Canyon sand discovery, completed for 152 bbl. of 40°-gravity oil a day through 24/64-in. choke from perforations at 5,208-15 ft. Location is about 1 mile north and slightly east of Lake Trammell and 3 miles from Lake Trammell field production.

Northeast of Blackwell, Continental Oil Co. 1-248 Mary Dan Earwood was drilling ahead at 6,167 ft. following a 1½-hour drill-stem test at 6,127-50 ft. Recovery on the test was 130 ft. of sulfur-cut drilling mud with no shows.

In the Hylton Strawn field of southeast Nolan County, Seaboard Oil Co. completed its 2-A Billie Hanks, ½-mile west stepout to the field discovery, for a daily flowing potential of 288 bbl. of oil. Production was through 22/64-in. choke, from perforations at 5,412-35 ft.

W. B. Hamilton et al 1-B Morgan and Marshall, Young County Mississippian discovery 12 miles west of Graham, completed for 155 bbl. of 42°-gravity oil a day through 12/64-in. choke. Pay was open hole at 4,653-57 ft.

Greenbrier Oil Co. completed a gas discovery in Wise County, 2½ miles northeast of Cottondale. The Bend conglomerate producer, 1 C. R. Bridges, gaged 4,800,000 cu. ft. of gas a day from pay at 5,462-80 ft. Flowing pressure and choke size were not reported.

Greenbrier staked location for a 5,000-ft. test in the Newport area of Clay County as the 1 J. F. Lancaster, Block 17, Freestone CSL Survey.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Clay County: R. Benton Ross 2-B Householder, J. Wesson Sur., A-717, TD 1,741 ft., pay 1,740 ft., IP pumped 41 bbl. 42°-gravity oil.

Fisher County: General Crude Oil Co. 2 Mrs. C. T. Webb, 210-3-H&TC, TD 5,650 ft., pay 5,613 ft., IP 357 bbl. 43°-gravity oil in 16 hr., ¼-in. choke, TP 850 psi., GOR 930 cu. ft.

Haskell County: E. L. Wilson 1 Martha E. Gauntt, R. Langham Sur., TD 4,840 ft., pay 4,835 ft., IP pumped 30 bbl. 40°-gravity oil.

Stephens County: Chas. Christopher 1 G. L. Donnell, Sec. 1,208, TE&L Sur., TD 3,191 ft., pay 3,188 ft., IP pumped 18 bbl. 41°-gravity oil.

Wichita County: Burk Royalty Co. 1-B. C. Birk, Netherly & Kennard Sur., TD 714 ft., pay 707 ft., IP pumped 6 bbl. 36°-gravity oil.

Wise County: Lone Star Producing Co. 1 E. L. Vaught, Brice Woody Sur., A-1-216, TD 5,872 ft., elev. 988 ft., Marble Falls 5,252 ft., perforated 5,393-5,436 ft., IP 2,900,000 cu. ft. gas.

Young County: Panhandle Producing & Refining Co. 1 Mrs. Johnnie Casburn, Sec. 3,413, TE&L Sur., TD 4,688 ft., gas pay 4,372-92 ft., IP 740,000 cu. ft. gas.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: E. B. Clark 1 Mary Ann Garvey Blk. 66, Harris Subd., dry, TD 1,507 ft.

Davis & Calvin 1 E. E. Kunkel, Blk. 13, Sec. 55, Meades LM Pasture Subd., dry, TD 1,292 ft.

Callahan County: Bay Petroleum Corp. 3 Frank A. Windham, GH&H Sur. 160, dry, TD 1,400 ft., Hope sand 1,155 ft.

West Central Drilling Co. 1 Murray Harris, Sec. 99, BBB&C, dry, TD 4,709 ft.

Clay County: L. T. Burns 2 J. W. Linderman, Blk. 3, Clark & Plumb, dry, TD 5,548 ft.

Harper-Turner Drilling Co. 1 Greminger, Sec. 56, Clark & Plumb, dry, TD around 4,000 ft.

Coleman County: Joe Spillers 1 Tom Stewardson, J. A. Sylvester Sur. 288, dry, TD 2,050 ft.

Tex Harvey Oil Co. 1 E. E. Thate, Mark Osod Sur. 172, dry, TD 3,433 ft.

Cooke County: J. W. Baldwin 1 Fred Payne, Robert Key Sur., A-356, dry, TD 1,606 ft.

Fred Wimberly Drilling Co. 1 R. L. Cox, J. A. Ward Sur., A-1,146, dry, TD 3,756 ft.

Eastland County: Bankline Oil Co. 1 Ralph Kendall, 75-4-H&TC, dry, TD 3,502 ft.

Jones County: E. K. and E. M. Burt 1 E. D. Shanafelt, 31-1-BBB&C, dry, TD 3,859 ft.

E. L. Wilson 1 Mrs. W. T. Crier, Sec. 8, BAL Sur., dry, TD 2,023 ft.

Mills County: A. W. Adkisson 1 H. P. Jones, James Forrester Sur. 295, dry, TD 2,330

REMOVES PARAFFIN
•
NO WELDING NECESSARY
•
SAVE TIME • MONEY
INSTALLED AT WELL
AT THE WELL SITE the scraper is applied by a crew member using any simple tool, such as screw driver or tire iron. And . . . after applying a few scrapers a crew member gets the hang of installation and really moves along so that he installs quickly and efficiently one scraper after another.
TRIPLE SPIRAL
PARAFFIN REMOVERS
* IS NOT WELDED in any way.
* CAN BE SALVAGED and used again on new rods.
* Eliminates cost of rod handling and transportation to factory or shop for installation.
* Spaced for any stroke length.
* Will not slip if rod is stressed—tested for 2350 lbs. grip.
* Now in use in EVERY AREA where paraffin is a problem.
* Sizes available for IMMEDIATE DELIVERY to fit ⅝" to 1" rods in 2" to 3" tubing.
Distributed by Sucker Rod Manufacturers
AVAILABLE THRU YOUR SUPPLY STORES
MANUFACTURED BY
The TRIPPLEHORN CO.
P. O. BOX 6326
DALLAS, TEXAS

ft., elev. 1,454 ft., Mississippian 1,938 ft., Ellenburger 2,152 ft.

Montague County: Bolin Oil Co. Ed Hinton, T. Walker Sur., A-854, dry, TD 4,841 ft., Caddo 4,738 ft.

Palo Pinto County: Ernest Loyd 11 Mrs. E. Hartnett, Thomas Harrell Sur., A-236, dry, TD 1,421 ft.

Shackelford County: Harley Sadler and Emmitt Boyd 1 Dick Shelton, Sec. 592, TE&L Sur., dry, TD 341 ft.

Stephens County: Gray Oil Co. 4 Effie Newham, 44-6-T&P, dry, TD 2,110 ft.

Throckmorton County: F. R. Perkins 1 C. O. Coone, C. Collier Sur., A-179, dry, TD 4,389 ft.

P-M Drilling Co. 1-B E. P. Davis Est., J. B. Stiles Sur., A-1,279, dry, TD 4,519 ft.

Warren Oil Co. 1 E. T. Stocker, Sec. 671, TE&L Sur., A-272, dry, TD 4,610 ft., Caddo 3,661 ft.

Wilbarger County: An-Son Petroleum Corp. 1 Herring National Bank, 25-14-H&TC, dry, TD 5,010 ft.

Young County: Paul Bilbrey & Wayne Albritton 1 Shanefelt, A. Clingburg Sur., A-1,721, dry, TD 803 ft.

A. F. Snappenberger and C. U. Bay 1 Lillie Calvin Est., A. Rohus Sur., A-240, dry, TD 4,250 ft.

Oklahoma

Washita Test Indicates New Hoxbar Discovery

NEW incentive for continued exploration along the south side of the Anadarko basin off the north flank of the Wichita-Amarillo uplift is being given by another indicated oil-pool discovery, located 3½ miles south of Cordell, in Washita County.

Prospective discovery well, 1 Britton, C NE NE 28-9n-17w, drilled by Helmerich & Payne, Inc., on a farm-out from The California Co., got 930 ft. of clean 43.9°-gravity oil in a 2½-hour drill-stem test in granite wash at 7,978-8,008 ft. in the Pennsylvanian-Hoxbar, producing horizon of the Elk City field, approximately 20 miles to the northwest.

In the test, gas was at the surface within 4 minutes after the tool was opened and flowed at an estimated rate of 825,000 cu. ft. per day during the first 40 minutes, declining to an estimated 695,000 cu. ft. per day at the close of the test. Flow pressure varied from 150 to 225 psi. Bottom-hole pressure, shut in, was 3,275 psi. Operators are drilling ahead to their original objective of 9,000 ft.

Additional, deeper potential production has been found in the East Bradley, McClain County, by Cities Service Oil Co. at its 1-D Jones, C NE SE 30-5n-4w. It is in the basal Bromide zone, where in a drill-stem test at a total depth of 11,590 ft., the well flowed clean oil, starting after the tester was open 175 minutes. It made 13 bbl. the first hour, and then 10 bbl. per hour the next 2 hours. Recovery in the breakdown was 1,800 ft. of clean oil and 180 ft. of oil and gas-cut mud. Gravity of the oil was 43.9°.

Previous tests in both the first and second Bromide zones also obtained good oil flows and recoveries. First Bromide tested at 11,220-11,305 ft., flowing 35 bbl. of oil per hour with 1,500,000 cu. ft. of gas per day. The second Bromide zone was tested at 11,305-79 ft., flowing at the rate of 60 bbl. per hour and recovering 3,200 ft. of oil and 130 ft. of oil and gas-cut mud. Present production of the field is from the Chimney Hill (Hunton) section. Hole is being cored ahead with casing previously having been run through the first and second Bromide zones to 11,460 ft.

J. M. Huber Corp. is drilling ahead at its 1 School Land, NW NW NE 1-4n-23eCM, south offset to Flynn Oil Co.'s recently completed oil discovery well, 1 School Land, north of Beaver, in Beaver County, Oklahoma Panhandle. Drill-stem tests in the discovery well's Marmaton lime pay zone, topped at 5,525 ft. (surface elevation 2,495 ft.), proved disappointing and operators will explore productive possibilities of deeper horizons. The Huber well is the first confirmation test in the area to reach the discovery well's pay zone. In a 60-minute drill-stem test at 5,516-33 ft., it got some gas in 6 minutes but recovered only a small amount of oil-cut mud in the breakdown. The second test, with hole deepened to 5,543 ft., recovered only 15 ft. of slightly oil-cut mud. The Flynn well produces from open hole at 5,540-49 ft. (surface elevation 2,503 ft.).

Cities Service Oil Co. has not reached the above pay zone in its east offset (1 Miles, SW SW SW 36-5n-23eCM) to the Flynn discovery well.

Sinclair Oil & Gas Co. appears to have discovered a shallow Deese sand pool in the area 5 miles west of Ardmore, in Carter County, southern Oklahoma. The indicated discovery well, 1 Pruitt, NE SE NE 19-4s-1e, originally projected to 10,000 ft., recovered 530 ft. of 34°-gravity oil and 135 ft. of oil-cut mud in a 60-minute drill-stem test at 2,248-70 ft. in the above sand. Drilling was stopped at 2,664 ft., and casing run through the pay to 2,400 ft. for production tests.

OKLAHOMA SUCCESSFUL WILDCATS

Cleveland County: Producers Development Co. 1 Nehr, C NE SE 20-9n-3w, flowed 192 bbl. 47°-gravity oil from second Wilcox 9,430-85 ft., TD 10,265 ft. (new pay in NW Norman)

Payne County: Kingwood Oil Co. 1 Speer Heirs, NE NE SE 18-17n-3e, pumped 18 bbl. oil from Skinner 4,072-78 ft., TD 4,399 ft. PBTD 4,186 ft.

OKLAHOMA WILDCAT FAILURES

Harper County: Deep Rock Oil Corp. 1 Lamunyon, C NE NW 21-28n-24w, dry, TD 8,500 ft.

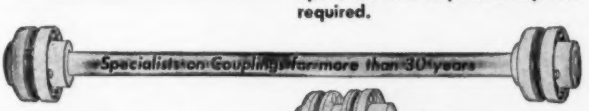
Hughes County: Sunray Oil Corp. 1 Wil-

THOMAS Flexible ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

REFINERS! PIPE LINE MEN! DRILLING ENGINEERS! LABORATORY TECHNICIANS!

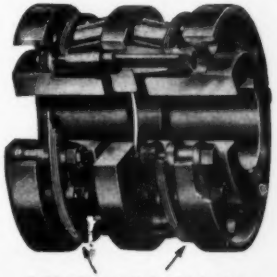
All can use Thomas Couplings to their advantage on Pumps, Compressors, Cooling Towers, Rigs or any tough job where continuous operation and dependability are required.



Patented Flexible Disc Rings of special steel transmit the power and provide for misalignment and end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes:
½ to 40,000 HP
1 to 30,000 RPM

BACKLASH FRICTION WEAR and CROSS-PULL are eliminated
Lubrication is not required!



PATENTED FLEXIBLE DISC RINGS

THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

• • •

NO MAINTENANCE PROBLEMS.

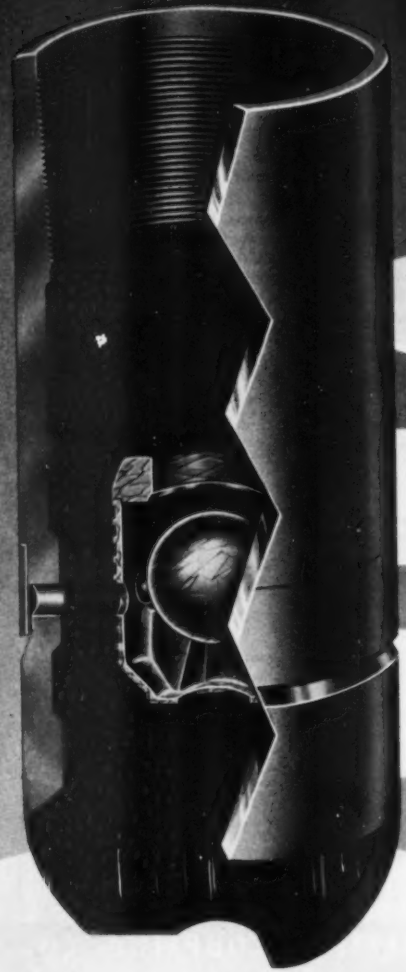
• • •

ALL PARTS ARE SOLIDLY BOLTED TOGETHER.

Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

"PERFECT CIRCLE" Cementing



With LARKIN GEYSER SHOES

Thousands of successful cementing jobs have proved that the Larkin Geyser Shoe does all that a cementing shoe can do toward a successful cement job.

The Larkin Geyser Shoe

- ....distributes cement slurry evenly around the casing.
- ....imparts a jetting action that washes mud cake from the well bore.
- ....guides and floats safely and efficiently casing strings of any size to any depth.

Field Tested, Proved and Accepted

LARKIN

...Through Your Supply Store

LARKIN PACKER CO., INC. **St. Louis, Mo.**

liams, NW NE SW 24-8n-9e, dry, TD 4,610 ft.

Lincoln County: Quinlan 1 Scott, SE SE NE 4-16n-6e, dry, TD 3,450 ft.

Okfuskee County: D. W. Cotton 1 Fleming, SE SE SW 5-10n-11e, dry, TD 4,029 ft.

Pawnee County: Mid-States Pipe & Supply Co. 1 Renner, SE SE SE 29-11n-7e, dry, TD 2,720 ft.

Pottawatomie County: Hill, Elliott & Laub 1 Zelta Richardson, NW NE SE 28-8n-2e, dry, TD 5,861 ft.

Stephens County: The Texas Co. 1 Lundy, NW NW SE 8-1n-4w, dry, TD 8,431 ft.

Texas Gulf Coast

Harris County Wildcat Completed For Oil

HOUSTON.—Harrell Drilling Co. 1 Hance Baker Estate, wildcat in the South Bammel area of Harris County, has been completed for 93 bbl. of 40.8°-gravity oil daily from perforations at 6,417-23 ft. Gage was made through 10/64-in. choke under tubing pressure of 1,750 psi. and casing pressure of 2,040 psi. This new discovery is located in W.C.R.R. Survey, Section 5, Block 4, approximately 15 miles north of Houston.

Three miles southeast of Chocolate Bayou field in Brazoria County, The Texas Co. apparently has opened a new pool at 1 John W. Harris et al, Asa Brigham Survey. On a drill-stem test of perforations at 10,875-79 ft., the well flowed oil at the rate of 162 bbl. per day through a ¼-in. choke. This well is bottomed at 11,955 ft. with 5½-in. casing set at that depth.

A new pool has been opened in Jackson County in the West LaSalle area with completion of J. M. Flaitz 1 J. M. Bennett, V. Garcia Survey, Abstract 24. From perforations at 6,181-85 ft., the well flowed 179 bbl. of 41°-gravity oil daily through a 10/64-in. choke. Tubing pressure registered 1,700 psi.

At its confirmation test to the new East Jackson Pasture field in Chambers County, Standard Oil Co. of Texas has opened a new oil bearing sand at 1 Henry Gau et al, to establish the first oil production in the field. From perforations at 8,290-96 ft., the well flowed 24 bbl. of 39°-gravity oil daily. Hole is bottomed at 8,400 ft. with 7-in. casing cemented to 8,375 ft. This well is located 2,900 ft. southwest of 1 W. F. Gau, gas-distillate discovery well, which was completed at 8,289-90 ft. for 46,500,000 cu. ft. of gas daily.

Shell Oil Co. has potentialed 1 Kirby Lumber Co. Tract 125-A, oil discovery 1 mile west of Segno field in Polk County. Through a ⅛-in. choke, the well flowed 46 bbl. of oil daily from perforations at 5,322-40 ft. New discovery is located in James Stephenson Survey, Abstract 523.

A third new pay zone has been opened in East Mauritz field, Wharton County, at Johnson & Appling 1-A Kountze & Stewart. From 20 shot perforations at 6,790½-94 ft., the well flowed 130 bbl. of oil per day through 8/64-in. choke on potential test. Casing pressure registered 1,250 psi. and tubing pressure 1,100 psi.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Austin County: New pay at New Ulm—Wagner-Werner Co. 1 Marik et al, R. Von Roeder Sur., A-398, TD 10,358 ft., perf. 9,594-9,600 ft., IP 182 bbl. oil per day, 9/64-in. choke, 44.5°-gravity, TP 1,600 psi.

Brazoria County: New pay at Nash Dome—Dan J. Harrison 6 Groce, Thomas Alsberry Sur., A-2, TD 4,382 ft., perf. 3,986-96 ft. IP 12 bbl. oil per day, 9/64-in. choke, TP 1,180 psi., 24.5°-gravity.

Calhoun County: New pay at Minnie Welder—John W. Mecom 13 Welder, Jose Maria Rios Sur., TD 6,194 ft., perf. 5,348-54 ft., IP 35 bbl. oil per day, 8/64-in. choke, 33°-gravity, TP 1,550 psi.

Chambers County: New pay at No. Fig Ridge—H. R. Smith et al 2 Texas National Bank of Beaumont, T&NO RR Co. Sur. 73, A-247, TD 8,490 ft., perf. 8,399-8,402, IP 111 bbl. oil per day, 8/64-in. choke, TP 2,275 psi., 37°-gravity.

Colorado County: Gas discovery—Prince Drilling Co., Inc., 1 Minarcik "A", Samuel Kennelly Sur. A-30, TD 9,186 ft., per. 9,160-72 ft., IP gas well, no gage.

Jackson County: Hassie Hunt Trust 1 Hasdorff, Thomas Menefee Sur. TD 7,009 ft,. perf. 5,800-08 ft., IP 153 bbl. oil per day, 9/64-in. choke, CP 2,200 psi., TP 1,040 psi., 29°-gravity.

Jefferson County: Oil discovery—Hunt Oil Co. 4 Dishman-Lucas, William McFarland Sur. A-39, TD 8,747 ft., perf. 5,314-20 ft., IP 105 bbl. oil per day, 10/64-in. choke, TP 200 psi., 27.2°-gravity.

Orange County: Gas condensate discovery—Gabriel Oil Co. 1 Dartez, Theron Strong Sur. A-25, TD 8,912 ft., per. Frio in 8,100-ft. sand, IP 21,900,000 cu ft. of gas per day plus some 54.2°-gravity distillate.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Bee County: Bridwell Oil Co. 2 Beeville Unit 1, James Hefferman Sur. A-31, dry, TD 4,100 ft.

Morris Cannan 1 Campbell, Henry Coley Heirs Sur. A-138, dry, TD 7,560 ft.

Colorado County: Sinclair Oil & Gas Co. 1 H. R. Houck-Tract A, I&GN Sur., Sec. 53, A-269, dry, TD 11,705 ft.

The Texas Co. 1 Coddou et al, John McCrosky Sur. A-31, dry, TD 11,505 ft.

DeWitt County: O. W. Killam 1 Hoch, John M. Read Sur. A-538, dry, TD 8,000 ft.

Goliad County: Dallas Husky 3 L. C. Fromme, Noah G. Stebbins Sur., dry, TD 3,140 ft.

Grimes County: R. Olsen Oil Co. 1 E. L.

Coring
Straight hole drilling
Washover
Window cutting
Whip-stocking
Etc.

PROBLEMS solved with

Truco DIAMOND BITS
D&S CORE BARRELS

Drilling & Service

3031 Elm Street Dallas 1, Texas
OFFICE PHONE: Riverside-6811
NIGHT NUMBERS: TRemont-5559, Victor-3708, Dixon-4176

Other Offices-Services: Tyler, Texas 2-2742; Odessa, Texas 6-6774; Abilene, Texas 2-2790; Victoria, Texas 3264; Norman, Okla. 4360; Shreveport, La. 5-5474; Casper, Wyo. 3739; Carmi, Ill. 7799; Ft. Morgan, Colo. 1143; Great Bend, Kans. 7585

Distributors: Diamond Drilling Co., 2739 E. Willow St., Long Beach, Calif., Telephone: Long Beach 40-7949; Allied Services, Inc., Mt. Pleasant, Michigan Telephone: 29-861

Foreign: D. T. O'Connor, 500 Fifth Avenue, New York, N. Y.; Petroleum Industry Consultants, C. A., Caracas, Venez.; Denton - Spencer Co., Ltd., Calgary, Alberta, Canada.

THE OIL AND GAS JOURNAL

"That's about all the home office has to say on the subject, men."

Harris, Issac Jackson Sur. A-32, dry, TD 10,520 ft.

Hardin County: General Crude Oil Co. 1 Mills Co., H&TC RR Co. Sur. A-308, dry, TD 9,000 ft.

Harris County: Gulf South Oil Corp. 1 Waddell, George Bellows Sur., dry, TD 8,200 ft.

R. E. Hibbert 1 Rogers, J. D. Giddings Sur. A-924, dry, TD 8,002 ft.

Jackson County: Texas Gulf Production Co. et al 1 Mauritz Unit, Blk. 8, Francitas Farms Subd., Mary E. Johnson Sur. A-322, dry, TD 9,759 ft.

Jasper County: Standard Oil Co. of Texas 1 Newton County Lumber Co., Sec. 13, T&NO RR Sur. A-487, dry, TD 8,004 ft.

Refugio County: Paisano Trading Co., Ltd. et al 1 W. & E. Dammann, Jose Miguel & Maria Aldrete A-1-2-3 Sur., dry, TD 5,643 ft.

Victoria County: Grace Oil Co. 1 Terrell, John R. Sidek Sur., dry, TD 5,296 ft.

Washington County: The Texas Co. 1 Jeske et al NCT-1, E. Gordon Sur. A-49, dry, TD 9,738 ft.

Kansas

New Gove County Area Opened for Production

SKILES Oil Corp. is opening a new pool in Gove County where it is putting its 11 Lundgreen, NE NE NW 30-14-29, indicated discovery well, on the pump following swabbing tests, swabbing, the well made up to 10 bbl. of oil per hour after being treated with a total of 1,000 gal. of acid.

Production is from pay near the top of the Mississippian, where casing is perforated at 4,306-16 ft. Top of the Mississippian was logged at 4,303 ft. Hole and casing are bottomed at 4,336 ft. The well had the Lansing at 3,685 ft. Surface elevation is 2,628 ft.

Location of the discovery is about 4 miles southwest of the Coberly pool, the county's original production, opened less than two years ago. It is about a half mile west of a well drilled last year by Glenn Nye which tested the same pay, getting some oil but which failed to produce commercially.

Pumping equipment also is being set up at Murfin Oil Co.'s discovery well, 1 Dancer, NE NE NW 4-8-17, 3 miles southeast of Stockton, in central Rooks County. The well produced 15 bbl. per hour by swabbing. Casing is perforated at 3,148-52 ft., in the Lansing section, topped at 3,055 ft. Arbuckle lime, topped at 3,349 ft. and penetrated to 3,355 ft. failed to show for production. Casing is bottomed in the latter zone at 3,350 ft. Location is about a mile northeast of the Lone Star pool and about 2 miles southwest of the Stockton pool.

Wick Petroleum Co. appears to have opened a new Arbuckle producing area 2 miles south of Wakeeney, in Trego County, where its 1 Niedens, SE SE SW 16-12-23, produced at the rate of 9 bbl. of oil per hour by swabbing while testing through casing perforations at 3,838-44 ft. in the Lansing section topped at 3,786 ft. The pay previously had been treated with 500 gal. of acid. Before acidizing, it swabbed only 1 bbl. per hour. Hole had been drilled to 4,387 ft. in Arbuckle lime, topped at 4,348 ft.

Musgrove Petroleum Co. is succeeding in making a commercial producer at its 1 Dorman, NW NW NW 30-10-23, a rank wildcat in southwestern Graham County. On a late swabbing test after acidizing, the well produced at the rate of 7 bbl. of oil per hour. Production is from the Lansing section, opposite which casing is perforated at 3,961-68 ft. Total depth is 4,449 ft. in Arbuckle.

KANSAS SUCCESSFUL WILDCATS

Barton County: J. Honaker Drilling Co. 1 Essmiller, NE NE SW 26-18s-14w, flowed 2,507 bbl. oil from 3,312-20 ft. in Lansing-Kansas City, TD 3,491 ft. (opens Great Bend Airport pool)

Ellsworth County: E. K. Carey 1 Maes, SE SW SE 26-17s-8w, pumped 478 bbl. oil from 3,354-57 ft. in Arbuckle, TD 3,357 ft. (opens Maes pool)

KANSAS WILDCAT FAILURES

Barton County: L. D. Sargent 1 Jurgenson, NW NW NW 27-19s-15w, dry, TD 3,710 ft.

Butler County: National Associated Petroleum Co. 1 Faulkner, SW NE SE 6-26s-6e, dry, TD 2,807 ft.

Gaty 1 Scott, NE NW NW 17-27s-3e, dry, TD 2,569 ft.

Cowley County: McNish & Gralapp 1 Stout, SE SE SW 4-31s-6e, dry, TD 2-900 ft.

Wakefield 1 Weigle, NW NE NE 7-32s-6e, dry, TD 3,180 ft.

Ellis County: McKemie-Murfin Drilling Co. 1 Bowlby, NE SE NE 27-11s-16w, dry, TD 3,380 ft.

Stearns Drilling Co. 1 Fellers, NE NE SE 10-11s-16w, dry, TD 3,889 ft.

Hodgeman County: Armer et al 1 Hall, SE SE NW 11-24s-22w, dry, TD 5,240 ft.

Jackson County: Skelly Oil Co. 1 Beightol, NE NW NW 14-7s-13e, dry, TD 3,603 ft.

McPherson County: Continental Oil Co. 1 Anderson, SW SW SW 17-17s-4w, dry, TD 3,800 ft.

Pratt County: Lion Oil Co. 1 Omo, NW NW NW 2-29s-14w, dry, TD 4,694 ft.

Metropolitan Oil Co.-Tatlock 1 Randle, SE SE NW 30-26s-14w, dry, TD 4,650 ft.

Reno County: Godfrey et al 1 Smith, NE NE NE 23-25s-4w, dry, TD 4,152 ft.

Saline County: W. R. White 1 Ekstrom, NW NW NW 26-15s-2w, dry, TD 2,817 ft.

Sedgwick County: Gaty 1 Clark, SE NW SE 2-26s-1e, dry, TD 3,625 ft.

Wabaunsee County: Carter Oil Co. 1 Davis, SW NW SE 8-14s-10e, dry, TD 3,394 ft.

Once expanded by pump pressure, the cutter expansion of the Grant Underreamer is positive, and WEIGHT ON THE TOOL POSITIVELY CANNOT CAUSE THE CUTTERS TO RETRACT DURING OPERATION—yet by simply pulling up against the casing shoe or tight spot in the hole, the cutters will retract.

Larger Liners can be set—use of the Grant Underreamer prior to setting the liner provides increased capacity for cement, assuring a more effective cement job, or permits the running of a *larger liner.*

For all underreaming work—in all formations—Grant supplies the tool for the job. Call the Grant representative nearest you—write for Bulletin 24 giving full details—or see the Grant Section of the Composite Catalog.

Proven Grant Tools—Used Where Performance Counts

Hydrostatic Bailers	Bulletin No. 11
Liner Pullers	Bulletin No. 14
Pressure Releases	Bulletin No. 15
Hydraulic Expansion Casing Scrapers	Bulletin No. 17
Rotary Underreamers	Bulletin No. 24
Cable Tool Underreamers	Bulletin No. 27
Hole Enlargers	Bulletin No. 38
Reamers	Bulletin No. 43-A
Hydrostatic Perforation Cleaners	Bulletin No. 50
Dump Bailers	Bulletin No. 51
Roller Cutter Shale Bits	Bulletin No. 54
Sand Pumps	Bulletin No. 55
Well Cleanout Procedures	Bulletin No. 57
Wall and Bottom Hole Scrapers	Bulletin No. 58
Vertical Casing Scrapers	Bulletin No. 59

Write for Descriptive Bulletins on these Grant Tools

GRANT OIL TOOL COMPANY

Main Office and Plant
2042 E. Vernon, Los Angeles 11, Calif.
Branches Throughout California and The Mid-Continent

Subsidiary: MacClatchie Manufacturing Company

Central Area

ILLINOIS

Ryan & Sharp are opening a new McClosky lime pool at their 1 Apple, SW SW NW 28-5s-8e, 9 miles southwest of Carmi, White County. The well pumped and flowed initially at the rate of 25 bbl. of oil per hour before being acidized. Operators will acidize before making final completion. Saturation was logged at 3,385-95 ft. Hole was drilled to a total depth of 3,460 ft., where casing was cemented and then perforated opposite the saturated interval. The location is 3 miles from any other production, nearest being on the northwest side of the Stokes-Brownsville pool to the southeast.

Continental Oil Co. also is completing its new discovery well, 1 McCoy, located in the NW NE SW 4-7n-14w, 5 miles northwest of Obling, in northeastern Jasper County. The well produced 154 bbl. of oil with 16 bbl. of water per day in pumping tests following acidization. Pay zone is Rosiclare lime in open hole at 1,834-50 ft. Bottom of the hole still is in saturation. The well is 1¾ miles northwest of nearest production, located in the Kibbie area of the Main pool, in Crawford County.

INDIANA

Bury Drilling Co. is confirming its recent discovery of Benoist sand production southwest of Oatsville, Gibson County. Its 1 Freeman, SE SW NW 28-1s-9w, north offset to its discovery well, 1 Rode, found good saturation in the same pay and has casing run for completion. Total depth is 1,580 ft. Casing is bottomed on top the pay zone at 1,509 ft. A 2-hour drill-stem test of an interval at 1,513-19 ft. got 200 ft. of clean oil with an indicated bottomhole pressure of 580 psi. Additional saturation at 1,560-70 ft. was not tested. The discovery well, completed in January, produces from an interval at 1,583-88 ft. The area is about a mile from other production, located in the Union-Bowman field. Benoist sand is a new pay zone for the general area.

WESTERN KENTUCKY

John Buchman and associates 1 Swann, a wildcat located in 20-O-24, 2 miles northeast of Robards, southern Henderson County, and about the same distance from nearest production in that area, swabbed 1½ bbl. of oil per hour natural in initial tests of its prospective pay zone at 2,412-18 ft. in Aux Vases lime. Since then, the pay has been treated with 2,000 gal. of acid, and at latest report operators were cleaning out for further testing. Total depth is 2,590 ft. with bottom of the casing at 2,493 ft. The same operators are drilling at another location, 1 Branson, in 22-O-24, about a mile to the southwest, between the new well and the Robards field.

EASTERN KENTUCKY

In Greenup County, 19-X-79, and west of the town of Oldtown Van Everman et al topped Corniferous lime at 1,417 ft. and were drilling ahead at 1,425 ft. with no shows. Test is a confirmation well one location to the northwest of 1 James Watt Floyd which may open commercial production for the county.

In the Pilot Pool of Powell County, M. V. Wireman is testing light show of oil at 9 Albert Stewart located on South Fork. Corniferous lime was found at 840 ft. with oil in the top of formation. Bottomed at 843 ft. well is making ½ bbl. oil daily as operators continue testing.

In Elliott County and on the Sandy Hook Anticline, Herchenroeder et al were drilling at 558 ft. on 1 Ison and Green lease. This is a wildcat test located ½ mile east of a previously drilled dry wildcat test.

MICHIGAN

Reacidization with 6,000 gallons appeared to have improved and increased oil production considerably at H. E. Bell, Wm. B. Stewart and Basin Oil Co. 1 Hilts, NE SE SE 11-20n-1w, Richfield oil well, Butman field, Gladwin County. This well, which was bottomed out in the Richfield at 4,980 ft., and originally acidized with 1,000 gallons, showed an average of about 35 to 50 bbl. of oil a day after this first treatment, but after the 6,000 gallon acid treatment, well flowed 58 bbl. of net oil in 4½ hours, 52 bbl. in 1 hour, and was being flowed after that, for a short period, at the rate of 21 bbl. an hour, through a restricted choke. Last report indicated that well was shut-in for tank room. Although it was not expected that production from this well would hold at a rate near 21 bbl. an hour, it did appear that it would probably be the best completion to date in the Butman pool, regardless of the producing horizon. There are discovery wells in the Dundee, Traverse and Richfield, and this makes the third Richfield producer in the pool.

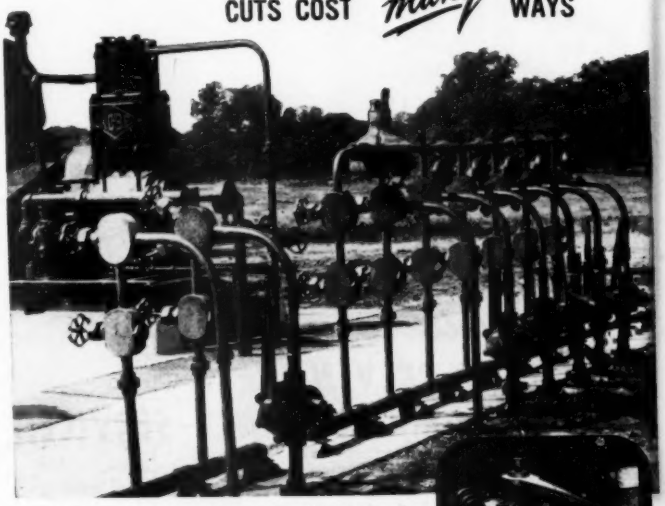
After Richfield and Dundee both failed to show commercial oil at Sun Oil Co. 1 Randall et al 1, N½ NW SW 1-20n-6w, Winterfield Township, Clare County, tests of Traverse were started, and it has been confirmed now that oil which was showing in quantities up to 60 bbl. a day from between the 5-in. and intermediate strings of casings was and is coming from the Traverse. The Randall well is the direct east 40-acre offset to the Cranberry Lake Richfield oil producing discovery and this shallower completion may cause Sun's well to be rated a discovery. After Traverse section from 3,198-3,200 ft. was perforated with 6 shots, well swabbed 5 bbl. of oil and considerable water in 8 hours. Well flowed 40 bbl. of oil from between the casings showing only a 2-bbl. water-cut. Top of Traverse was logged at 3,125 feet and Sun was preparing to perforate from the top of the zone down to about 3,175 ft. after lower perforations had been cemented off.

ILLINOIS SUCCESSFUL WILDCAT

Perry County: Ted Glass 1 Zmudzinski, SW NW SE 14-4s-1w, IP 38 bbl., Cypress 1,131-36 ft., TD 1,136 ft. (extension Tamarora pool).

Prevents PARAFFIN PROBLEMS

CUTS COST many WAYS



A typical example of how Kinney's simplified hydraulic header manifold is controlling paraffin and effecting substantial savings for operators everywhere!

Above—KINNEY PLUG INJECTOR

Below—SOLUBLE MECHANICAL PLUGS

No STEAMING . . . No ROD PULLING . . . No CHEMICALS are employed in the Kinney Paraffin Control system. There are really only two basic features—the KINNEY PLUG INJECTOR VALVE and KINNEY SOLUBLE MECHANICAL PLUG. When utilized on FLOW LINES . . . FLOWING WELLS . . . OR ROD WELLS paraffin accumulation can absolutely be controlled *from the surface!* Think how much downtime is saved; and the tremendous savings in critical materials, equipment, and labor in addition to improved production performance. We can point to hundreds of installations as solid reference of what Kinney will do. If you have paraffin problems it won't cost you one cent to get the Complete Kinney Paraffin Controlled from the surface story. WRITE—TODAY—for full details!

Kinney, Inc. ODESSA, TEXAS

P. O. BOX 3426 • TELEPHONE 4584

1418 EAST 5TH STREET

ILLINOIS WILDCAT FAILURES

Coles County: E. Zink 1 Snoddy Community, NW SE SE 13-13n-10e, dry, TD 530 ft.

Jasper County: Arnold Wilson 1 T. L. Smith, NE SW SW 22-8n-14w, dry, TD 761 ft.

Madison County: George Cassens 1 Leitch, E½ NW NE 34-6n-6w, dry, TD 660 ft.

Lawrence County: R. H. Comptan 1 Racop, SE SW NE 27-5n-11w, dry, TD 3,259 ft.

E. F. Moran 1 Von Tress, SE NE SE 4-2n-12w, dry, TD 2,211 ft.

INDIANA SUCCESSFUL WILDCATS

Knox County: Cline & Lambert 1 Nelson, SW SE SE 30-2n-8w, IP 8 bbl., Jackson 1,268-74 ft., TD 1,276 ft. (extension and new pay zone Monroe City pool).

Pike County: Wilson & Bradshaw 1 Dorsan, SW SW SW 16-1s-8w, IP 150 bbl., Benoist 1,360-65 ft., TD 1,365 ft. (discovery well Giezen pool).

Posey County: C. C. Clark 1 Junker, SW SE SW 13-6s-13w, IP 11 bbl., Waltersburg 1,911-18 ft., TD 2,762 ft. (extension Caborn pool).

INDIANA WILDCAT FAILURES

Pike County: Bury Drilling Co. 1 Miller, NW SW SW 19-1s-8w, dry, TD 1,613 ft.

Posey County: Simon Lebow 1 Esche, SW NW NW 7-6s-12w, dry, TD 808 ft.

Vanderburgh County: Slagter Producing Co. 1 Calvert, SE NE SE 19-4s-11w, dry, TD 2,672 ft.

Vigo County: Dr. C. R. Labier 1 Leach, SW NW SE 3-12n-8w, dry, TD 1,645 ft.

WESTERN KENTUCKY SUCCESSFUL WILDCATS

Muhlenberg County: Hanley & Bird 1 Ringo, NW NW SW SE 23-1-2E, IP 10 bbl., Benoist 1,537-50 ft., TD 1,849 ft. (extends Rhodes School pool).

Webster County: John Tuttle 1 Lyles, W½ NW NW SW 10-N-2E, IP 65 bbl., Cypress, 2,273-79 ft., TD 2,281 ft. (extends Poole West pool).

(Continued on page 180)

DON'T RISK SCALE AND CORROSION

Control them with

WRIGHT PREVENTIVE MAINTENANCE SERVICE!

EXCESSIVE scale and corrosion in your equipment can result in costly production delays and unnecessary maintenance costs. Hundreds of plants are now using Wright Water Conditioning Chemicals to control, and in many cases eliminate, scale and corrosion in engine jackets, heat exchangers, compressors, cooling tower systems—in fact wherever water is used.

The Wright Service includes more than the chemicals. It starts with a scientific analysis of your water conditioning problems. The recommended solution to your specific problem will be based upon our specialized knowledge gained in years of practical water conditioning experience. Write us or call in your Wright Field Engineer for a study of your system.

Wright CHEMICALS

WRIGHT CHEMICAL CORPORATION

Specializing in Water Conditioning

GENERAL OFFICES AND LABORATORY: 615 West Lake Street, Chicago 6, Illinois

Offices in Principal Cities

SOLE DISTRIBUTOR OF NELSON CHEMICAL PROPORTIONING PUMPS

Rocky Mountain

Fifth Oil Discovery Found in Uintah Basin

DENVER. — Another apparent discovery for the Tertiary producing area of the Uintah Basin of northeastern Utah has been made with the recovery of oil on drill stem test at the Deep Well Production Co. of California South Myton area wildcat. The well is 1 Lambert, C SW SW 22-8s-16e (SLM), 20 miles east of the Duchesne, Utah, pool, which also produces from the fractured shales of the basal Green River formation. The test was of the zone 6,265-6,314 ft. and gas was recovered at the surface in 10 minutes, at an estimated rate of 50,000 cu. ft. to 100,000 cu. ft. daily, with a recovery of 590 ft. of 44°-gravity oil and 10 ft. of oil cut mud in 1 hour. Deep Well has run casing for completion of the well in this zone. This is the fifth discovery in the past two years in this portion of Utah and an active wildcat campaign has been underway in the area for the past year.

East of the Pilot Butte field, Fremont County, Wyoming, Brinkerhoff Drilling Co. of Casper made a new Muddy sand discovery at 1 Gessell, NW SW SW 14-3n-1w (WRM), with the well flowing from that formation. The well flowed on drill-stem test of the zone 3,872-3,915 ft. with oil at the surface in 9½ minutes. Casing was cemented at 3,900 ft., 50 ft. below the top of the Muddy, and the well flowed an initial of 150 bbl. of oil daily from the bottom zone. An additional section of the Muddy may be perforated.

Carter Oil Co. found Tensleep oil on drill-stem test of 1 State Burke, SW SE SE 36-37n-79w, wildcat in the Burke Ranch area, Natrona County, Wyoming. Tensleep was found at 8,376 ft. and on 1-hour test of the zone, 8,373-84 ft. the well made 300 ft. of 31°-gravity oil and 200 ft. of mud. Another test below this zone showed only mud, and the operator is coring below 8,436 ft. The wildcat failed to show production on tests of lower Cretaceous sands. Tensleep produces at Salt Creek and recently oil was found at Teapot in that formation, with both of these fields north of the Burke Ranch area.

A new pay discovery of considerable importance to the Green River Basin of southwestern Wyoming and northwestern Colorado has been announced by Mountain Fuel Supply Co. at the deep Hiawatha test. The well was drilled to Nugget at 14,702 ft. total depth, and failed to produce from lower sands. At this depth the well established a record for depth in Colorado. Mountain Fuel plugged the well back to 4,988 ft. with casing below that depth, and perforated the zone, 4,885-4,930 ft., probably in Lance (upper Cretaceous) and has announced completion of the well with a flow of 9,000,000 cu. ft. daily. The well is 1 Unit, Lot 5, Section 14-12n-100w, in the center of the Hiawatha field, which produces gas from lenticular Tertiary sands. Lance has not been a productive zone through this portion of the Rocky Mountains.

After perforating the zone 15,960-15,978 ft. with 108 holes and 15,413-15,996 ft. with 318 holes Pure Oil Co. is now testing 3 Unit, SW NW SE 10-33n-84w, West Poison Spider field, Wyoming. Casing was perforated opposite the Lakota sand after the well failed to produce commercially from the Nugget. The well flowed a small amount of oil on Nugget tests, but is expected to be commercial from the Lakota, following core analyses from that zone. Pure's discovery in this field is producing from Frontier sands at around 13,250 ft. with one well a Mesa Verde discovery at 10,000 ft. The deep tests were located following seismic work through this area.

WYOMING WILDCAT FAILURES

Converse County, Nylen Ranch: The Cal-

ifornia Co. 1 Platte Valley, E½ NW NW 16-31n-69w, dry, TD 1,495 ft.

Johnson County, North Tisdale: Mark Davis 1 Government, NW NW SE 12-42n-81w, dry, TD 4,018 ft. Dakota 2,080 ft., Lakota 2,205 ft., Morrison 2,355 ft., Sundance 2,450 ft., Red beds 2,630 ft., Tensleep 3,977 ft. (water).

Niobrara County: Roy A. Sharp 1-XXX Government, SE SW SW 14-34n-64w, dry, TD 1,560 ft. Converse 1,405 ft., Minnelusa 1,260 ft.

Teton County, Ramshorn: George G. Travis 1-A Unit, N½ SE SW 5-43n-114w, dry, TD 2,320 ft. Madison 1,331 ft.

Washakie County, David Dome: Hiram Lewis 1 Government, NW NW SW 24-

(Continued on page 180)

Appalachian-Ohio

Kermit District Reports Large Gas Well

PITTSBURGH.—Beaver Pond district, Mercer County, West Virginia, United Fuel Gas Co. 6478 A. W. Hicks resulted in a deep dry hole. Efforts to produce the shallow gas in the Weir sand, after shooting, were abandoned. The elevation of this well is 2,834 ft., Corniferous Lime 8,012 ft., Oriskany sand 8,053 ft., show gas 8,083 ft., T D 8,175 ft. Kermit District, Mingo County, United Fuel Gas Co. 6751 Cotiga Development Co., gaged 8,209,000 cu. ft., gas in the Big lime, T D 2,052 ft.

Maryland.—Garrett County Western Maryland Gas Co., completed 1 Myrtle McGee, resulting in a dry hole, elevation 2,433 ft., chert 3,798 ft., Oriskany sand 3,908 ft., T D 3,940 ft. Delaware Oil & Gas Co. 1 Holloway, completed as a gas well in May 1951, is being drilled deeper from 3,320 ft., and is at 3,345 ft. Shaw & Smith 1 George Harvey, completed in June 1951 at 3,896 ft. is being cleaned out to acidize and it may be drilled deeper.

Pennsylvania.—Unity Township Westmoreland County, Peoples Natural Gas Co. 4003 A. J. Dotterway, elevation 2,094 ft., is drilling at 5,900 ft. This is the only wildcat test which is actually drilling at this time in this area.

WEST VIRGINIA WILDCAT FAILURE

Mercer County, Beaver Pond District: United Fuel Gas Co. 6478 A. W. Hicks, elev. 2,834 ft., dry, shows of gas in Weir sand, Corniferous lime 8,012 ft., Oriskany sand 8,053 ft., show gas 8,083 ft., T D 8,175 ft.

MARYLAND WILDCAT FAILURE

Garrett County: Western Maryland Gas Co. 1 Myrtle McGee, elev. 2,433 ft., dry, chert 3,798 ft., Oriskany sand 3,908 ft., ft. TD 8,175 ft.

OHIO

Two producers were added to the New Castle pool in Coshocton County. The Preston Oil 5 Charles Richards, 3rd Qr., made 40 bbl. natural from Clinton sand at 3,332-3,379 ft., and increased to 100 bbl. in 24 hours after a 60 qt. shot. The Oxford Oil 1 Wm. Frazee, 3rd Qr., had a fair oil showing natural in sand at 3,223-3,233 ft., and 30 bbl. in 24 hours after shot.

The Waverly Oil Works Co. 2 Cartnal Bros., 2nd Qr., Hanover Township, Licking County, a one-third mile step-out, logged the Clinton at 2,682-2,720 ft. with a showing of both oil and gas. After shot, the producer made 45 bbl. and 200,000 cu. ft. gas.

Allen Willey et al 3 Forest Taylor, Lot 26, Clark Township, Coshocton County, made 60 bbl. the first day after shot. Clinton was found at 3,543-78 ft.

OHIO WILDCAT FAILURE

Lorain County, Ridgeville Township: Ohio Fuel Gas Co. 1 Frank Lenner, Lot 18, Clinton 2,406-16 ft., dry, TD 2,547 ft.

To a Company seeking from $200,000 to $300,000 Capital

- Twenty-year-old New York investment firm will underwrite on a best effort basis the sale of capital stock of a sound producing Oil or Gas or Chemical company seeking up to $300,000 for expansion purposes only.

Present management will retain complete control of company

- Only concern with a good earnings record and sound financial statement will be considered. Must have some present production with good speculative potential.

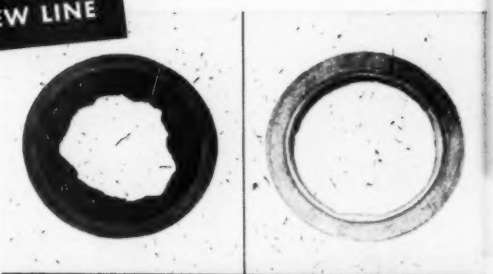
Reply in strict confidence. Principals only. No obligation. Write

Koellner & Gunther, Inc.
31 Clinton St., Newark, N. J.
Telephone MArket 3-0190

REHABILITATE YOUR OLD PIPE LINE AT MUCH LESS THAN THE COST OF A NEW LINE

Without appreciably disturbing present service . . . you can get new pipe line performance from old cast iron or steel pipe line. Line that pipe to give a new, continuous, smooth-surface. Ask PIPE LININGS, INC. to use the patented processes that apply cement mortar lining quickly to pipe line interiors . . . with only momentary interruption to install sectional by-pass lines. You can do it at much less than the cost of installing a new pipe line. Write TODAY!

Tate process used on Line 4" to 16". Centriline Process used on Line 16" to 144". Consult our hydraulic engineers . . . they are at your service.



BEFORE AFTER

CEMENT MORTAR LINING WILL . . .

Protect against discoloration and contamination
Protect against corrosion
Improve flow coefficients
Prevent leakage
Reduce maintenance costs
Reduce pumping costs

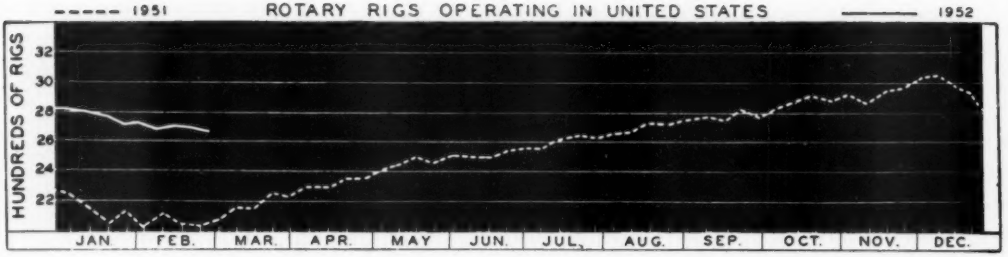
PIPE LININGS, Inc.
A subsidiary of
American Pipe and Construction Co.
4675 Firestone Blvd.
South Gate, California
(In the East—CENTRILINE CORP., 140 Cedar St., New York 6, N.Y.)

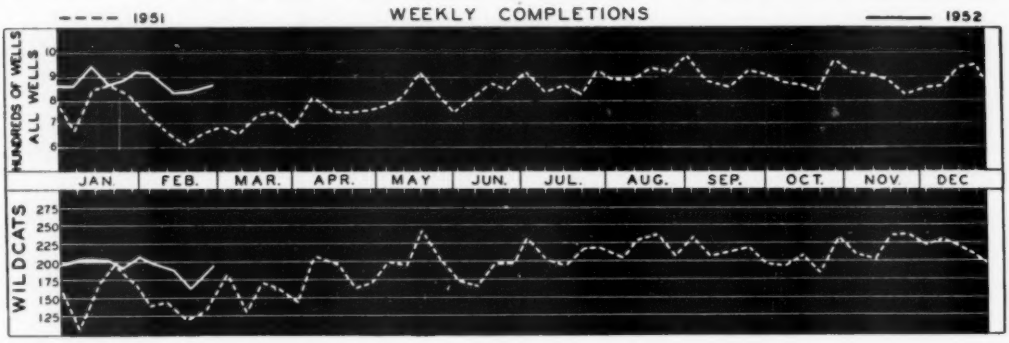
PIPE LININGS INC.
4675 Firestone Blvd., South Gate, Calif.
Please send complete information on how we can obtain new pipe line performance from our old line.

Name _____

Address _____

City _____ Zone ____ State ____





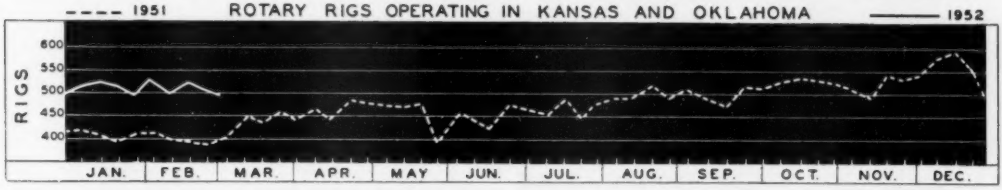
CURRENT STATISTICS

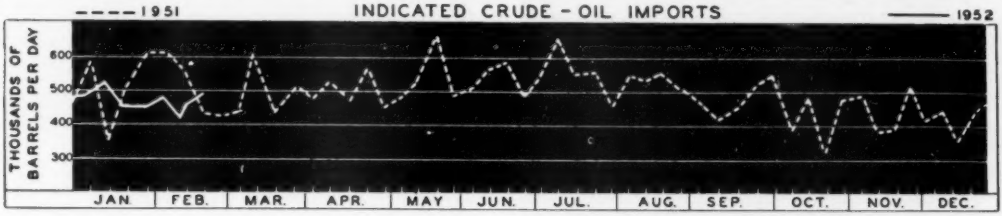
EXPLORATION

WEEKLY WELL COMPLETIONS . . . WEEK ENDED MARCH 1, 1952

	Total of all wells					Mar. 1		Wildcat completions and discoveries									
													Cumulative total, 1952				
	Comp.	Oil	Gas	Dry	Footage	1952	1951	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	12	5	0	*7	17,700	76	6	0	0	0	0	0	0	0	0	0	0
Pennsylvania	30	12	4	†14	54,460	258	124	0	0	0	0	0	0	0	0	1	1
West Virginia	9	2	5	2	28,622	124	107	0	0	0	1	1	0	0	1	1	2
Ohio	13	3	1	9	35,000	140	130	0	0	0	0	0	0	0	1	0	1
Indiana	27	19	0	8	44,886	176	169	3	0	0	4	7	10	0	2	57	69
Kentucky	30	17	0	13	49,570	211	129	2	0	0	6	8	6	0	0	36	42
Illinois	19	7	0	12	43,033	234	317	1	0	0	5	6	2	0	0	54	56
Michigan	15	8	1	6	37,467	103	104	1	0	0	4	5	7	0	1	38	46
Kansas	114	66	1	47	377,044	872	683	2	0	0	16	18	18	0	3	149	170
Nebraska	0	0	0	0	0	44	54	0	0	0	0	0	2	0	0	27	29
Oklahoma	98	53	7	138	352,909	1,091	894	2	0	0	7	9	10	1	3	110	124
Texas	360	204	17	139	1,759,505	3,006	2,616	15	1	4	80	100	122	11	21	689	843
North Central (Dist. 7-B & 9)	97	45	2	50	304,259	909	761	5	0	2	24	31	73	0	6	298	377
West (Dist. 7-C & 8)	110	83	1	26	653,782	940	808	2	0	1	17	20	21	0	1	110	132
Panhandle (Dist. 10)	16	5	9	2	50,226	114	134	0	0	0	1	1	1	0	1	14	16
Eastern (Dist. 5 & 6)	28	20	0	6	152,863	154	176	1	0	0	6	7	5	1	0	39	45
Gulf Coast (Dist. 2 & 3)	50	23	5	22	367,737	455	381	6	1	1	15	23	12	7	5	105	129
Southwest (Dist. 1 & 4)	61	28	0	33	230,638	434	356	1	0	0	17	18	10	3	8	123	144
Louisiana	34	13	4	17	228,299	386	337	0	0	1	4	5	6	3	1	42	52
Northern	17	8	3	6	64,970	216	155	0	0	1	1	2	2	0	1	19	22
Southern	17	5	1	11	163,329	170	182	0	0	0	3	3	4	3	0	23	30
Arkansas	2	2	0	0	6,706	65	65	0	0	0	0	0	2	0	0	9	11
Mississippi	5	2	0	3	39,241	74	38	0	0	0	2	2	4	0	0	30	34
Southeastern States	1	0	0	1	11,794	8	12	0	0	0	1	1	1	0	1	4	6
Montana	0	0	0	0	0	28	24	0	0	0	0	0	2	0	0	7	9
Wyoming	14	6	0	8	63,112	111	103	0	0	0	6	6	8	0	1	20	29
Colorado-Utah	15	3	1	11	80,101	94	39	0	0	0	7	7	6	0	2	33	41
New Mexico	17	7	8	2	85,095	151	112	1	0	1	1	3	4	0	1	11	16
California	53	36	2	15	210,907	420	302	4	0	0	13	17	18	0	0	81	99
North Dakota	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1
Miscellaneous (Md.)	1	0	0	1	3,940	12	6	0	0	0	1	1	0	0	4	2	6
Total United States	869	465	51	353	3,529,391	7,685	6,426	31	1	6	158	196	229	15	42	1,401	1,687
Total previous week	835	451	63	321	3,416,444			22	1	6	135	164	198	14	36	1,243	1,491
Total March 3, 1951	691	339	53	279	2,846,952			27	3	7	148	185	214	13	40	1,087	1,354

Service wells included: *7, †12, 15

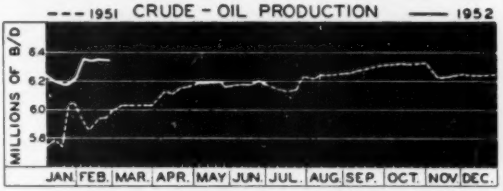


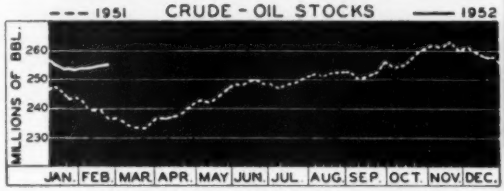


DAILY AVERAGE PRODUCTION FOR WEEK

	March 1, 1952 Crude oil	Lease condensate	Total	Feb. 23 total
Alabama	2,700		2,700	2,700
Arkansas	76,150	4,550	80,700	80,750
California	976,900		976,900	978,200
Colorado	79,200		79,200	80,800
Eastern	58,000		58,000	58,000
Florida	1,700		1,700	1,700
Illinois	160,700		160,700	163,400
Indiana	28,700		28,700	29,500
Kansas	323,000		323,000	325,000
Kentucky	35,300		35,300	34,600
Louisiana	616,450	41,150	657,600	657,600
North Louisiana	112,500	15,150	127,650	127,650
South Louisiana	503,950	26,000	529,950	529,950
Michigan	39,100		39,100	37,300
Mississippi	101,300	4,750	106,050	104,175
Montana	22,800		22,800	22,500
Nebraska	6,000		6,000	5,700
New Mexico	158,025	300	158,325	158,225
Oklahoma	518,800		518,800	518,600
Texas	2,873,175	46,550	2,919,725	2,919,725
Dist. 1	32,900	225	33,125	33,125
Dist. 2	166,500	4,000	170,500	170,500
Dist. 3	473,950	24,625	498,575	498,575
Dist. 4	262,500	5,200	267,700	267,700
Dist. 5	62,725	375	63,100	63,100
Dist. 6	124,050	4,325	128,375	128,375
East Texas field	271,300		271,300	271,300
Dist. 7-B	88,500	125	88,625	88,625
Dist. 7-C	136,700	6,775	143,475	143,475
Dist. 8	1,008,625	550	1,009,175	1,009,175
Dist. 9	162,300	350	162,650	162,650
Dist. 10	83,125		83,125	83,125
Utah	4,100		4,100	4,000
Wyoming	183,000		183,000	182,000
Total U. S.	6,265,100	97,300	6,362,400	6,364,475
Change from previous week, down			2,075	
Canada	100,425		100,425	119,448

Total U. S. production January 1-March 1 ..... 382,883,645 bbl.
Same period last year (crude plus cond.) ..... 361,903,850 bbl.



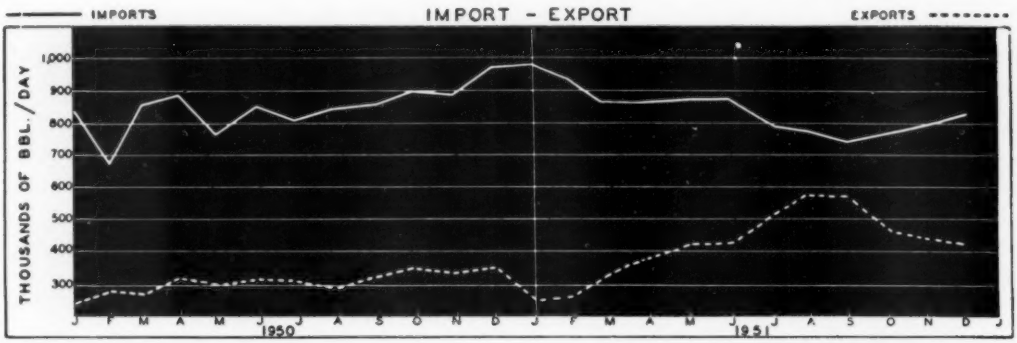


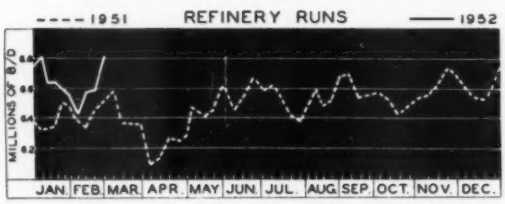
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

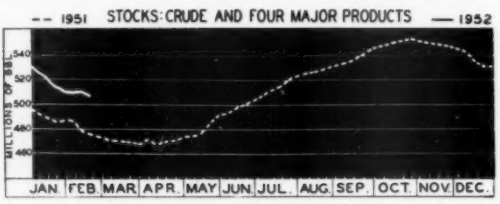
(Thousands of barrels)

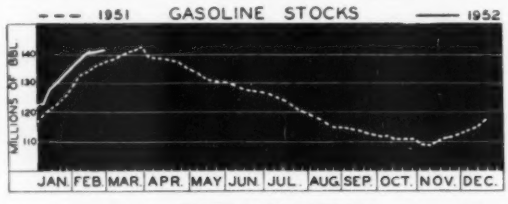
	Feb. 23, 1952	Feb. 16, 1952	Feb. 24, 1951
Pennsylvania Grade	2,100	2,072	2,043
Other Appalachian	1,903	1,783	1,396
Illinois, Indiana, Michigan	10,559	11,195	10,072
Arkansas	2,844	3,251	2,682
Louisiana	13,941	13,783	13,895
North	2,630	2,708	2,860
Gulf	11,311	11,075	11,035
Mississippi	3,344	3,568	3,040
New Mexico	7,636	7,911	6,918
Oklahoma and Kansas	40,008	39,198	37,713
Texas	121,523	120,832	110,474
East Texas proper	10,941	10,419	(†)
West Texas	55,461	55,992	(†)
Texas Gulf	24,973	24,525	(†)
Other Texas	30,148	29,896	(†)
Rocky Mountain	13,862	13,983	12,309
California	30,919	31,302	30,720
Foreign	6,505	6,075	5,942
Total	255,184	254,953	237,204

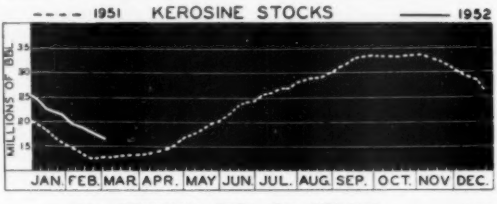
*Bureau of Mines. †Not comparable with current week.

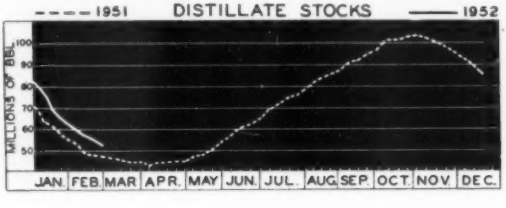


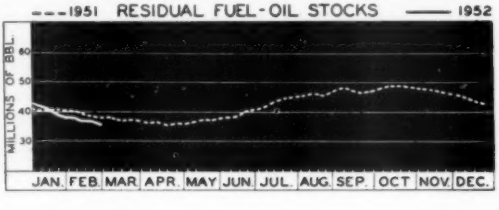










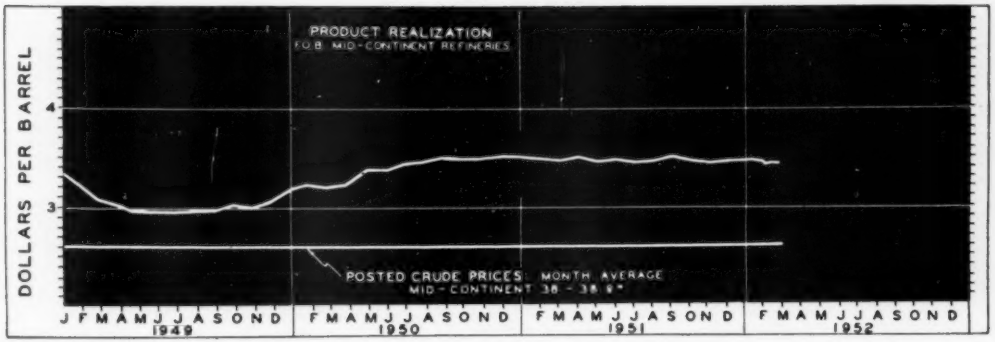


A.P.I. REFINERY REPORT, MARCH 1

(Thousands of barrels)

District—	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline†	Kerosine	Distillate	Residual	Bureau of Mines, March 1951: Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	1,023	393.6	34.3	297.6	252.9	25,101	6,370	15,893	8,717	1,000	371.6	47.0	245.1	235.6
Appalachian:														
District 1	113	47.6	4.1	18.2	16.3	3,142	315	501	417	101	40.3	7.0	15.0	13.4
District 2	81	41.9	4.9	12.1	17.6	1,377	130	390	136	77	32.8	5.4	10.8	18.2
Ind., Ill., Ky.	1,251	661.6	76.0	247.1	208.0	33,956	3,503	9,657	5,385	1,221	592.5	78.9	226.7	186.3
Okla., Kans., Mo.	560	313.4	16.9	134.7	63.1	17,206	995	6,626	1,345	529	274.0	16.5	126.6	75.1
Inland Texas	255	180.7	14.4	40.9	39.7	5,609	351	1,086	940	237	149.2	15.4	36.7	45.4
Texas Gulf Coast	1,677	746.4	132.7	395.3	279.9	24,663	2,751	7,601	5,934	1,572	688.2	136.0	364.4	274.3
La. Gulf Coast	530	232.1	37.1	152.7	57.4	7,478	1,428	2,460	1,819	486	226.9	65.2	109.1	63.8
N. La. and Ark.	77	34.0	7.0	16.7	7.1	3,212	381	796	178	68	24.8	7.3	17.6	7.8
Rocky Mountain:														
New Mexico	16	9.4		1.7	3.9	161		56	31	13	7.2	.3	2.5	3.2
Other Rocky Mtn.	225	103.6	8.6	46.1	45.7	5,450	230	1,328	988	222	103.6	7.5	41.2	47.1
California	1,008	410.7	1.0	218.6	394.7	15,432	224	6,095	10,551	943	396.5	12.6	131.0	377.3
March 1, 1952	6,816	3,183.0	337.0	1,581.7	1,386.3	142,787	16,683	52,489	36,441	6,469	2,907.6	399.1	1,326.7	1,347.5
February 23, 1952	6,599	3,075.4	375.7	1,507.4	1,289.1	141,765	17,669	55,055	37,111					
March 3, 1951	6,596	2,927.0	434.7	1,388.1	1,375.7	138,582	12,794	47,560	38,068					

*At refineries including natural blended. †Finished and unfinished.


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
DOLLARS PER BARREL
4
3
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
J F M A M J J A S O N D
1949
F M A M J J A S O N D
1950
F M A M J J A S O N D
1951
F M A M J J A S O N D
1952

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.43 for week ended February 23, $3.43 for previous week, and $3.50 for February 1951. The above trend information is based on volumes and current prices and therefore does not reflect changes in operating costs.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of March 5, 1952. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10-10¼	12-12.75	10¾-11
Premium gasoline, 86-88 octane	11-11⅜	13.5-13.75	11¾-12
42-44 w.w. kerosine	9-9¼	10-10.1	9
No. 2 straw fuel oil	8-8⅜	9-9.25	8
No. 6 residual	$1.45-1.55	$2.45-2.60	$1.75-1.90

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5½	5	5¼
Grade 18-55	6.6	6.1	6.35

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	13-13.5
750 vis., No. 3-4 neutral	16
2,000 No. 5-6 neutral	18-19

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	29
200 vis., No. 3 neutral, 0-10 pp.	16.5-17.5

Western Pennsylvania

145-155 vis., 10 p.t. bright stock	32.5
180 vis., 0 p.t. neutral	31.5

WAX

Mid-Continent

132-134 A.M.P.	5.5

CONTINUING pressure on natural gasoline resulted in another cut in price of 0.5 cent a gallon. This brings the quotation for Grade 26-70 on the Group 3 market to 5.875 cents and the North Texas price to 5.375 cents. Last year, the first drop in natural prices came about the middle of February, and the new price held until the first week in April. Since the second cut this year, effective March 3, came less than a week after the first, the low point for natural may be reached before peak of motor fuel stocks.

Actions of marketers and suppliers indicate that most of them are not expecting a serious strike by refinery workers. In the Mid-Continent, the increase in shipping instructions that came just before the announcement of the 1-week extension of the strike deadline has dwindled until movement out of primary storage may be even less than normal for this season of the year. Heavy fuel is particularly soft.

Product markets on the Gulf Coast are not as tight as they were earlier in the year. Heavy fuel is more readily available, but there is no softness in this part of the market and no price shading. The fact that supply and demand for heavy fuel on the Gulf Coast are about in balance has resulted in a decided reduction in the number of sales of Mid-Continent material for movement to Gulf Coast points. Tank-car shipments to the gulf will continue since some of the contracts made earlier in the winter called for movement through the summer months.

The decrease in movement of products up the river has resulted in a temporary surplus of barge capacity on the Gulf Coast. Also, this drop in up-the-river movement has been a factor in the increased product availability on the Gulf Coast.

Recent increases in tank-wagon prices for gasoline in New Jersey indicate that the price war in that area is about over. Esso Standard Oil Co. announced an increase in tank-wagon price for regular gasoline to 14.6 cents a gallon, the level that existed before the outbreak of price cutting in December.

Natural gasoline dropped another .375 cent late Wednesday, March 5.

CRUDE PRICES

GRAVITY SCHEDULE

	Signal Hill, Calif.‡	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex†
18-18.9	$1.93	....	....	....
19-19.9	1.98	....	....	....
20-20.9	2.03	$2.25	....	$3.12
21-21.9	2.07	2.27	....	3.14
22-22.9	2.12	2.29	....	3.16
23-23.9	2.18	2.31	....	3.18
24-24.9	2.24	2.33	$2.56	3.20
25-25.9	2.30	2.35	2.58	3.22
26-26.9	2.36	2.37	2.60	3.24
27-27.9	2.41	2.39	2.62	3.26
28-28.9	2.46	2.41	2.64	3.28
29-29.9	2.52	2.43	2.66	3.30
30-30.9	2.57	2.45	2.68	3.32
31-31.9	2.62	2.47	2.70	3.34
32-32.9	2.68	2.49	2.72	3.36
33-33.9	....	2.51	2.74	3.38
34-34.9	....	2.53	2.76	3.40
35-35.9	....	2.55	2.78	3.42
36-36.9	....	2.57	2.80	3.44
37-37.9	....	2.59	2.82	3.46
38-38.9	....	2.61	2.84	3.48
39-39.9	....	2.63	2.86	3.50
40 and above	....	2.65	2.88	3.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

Kettleman Hills, California*	$2.80
Louisiana:	
Beauregard Parish	2.60
Cotton Valley (distillate)	2.82
Cotton Valley (crude)	2.70
Texas:	
East Texas	2.65
Pecos County (Yates)	2.36
Conroe	2.83
Van	2.48
Pennsylvania Grade:	
Bradford	4.25
Southwest Pennsylvania	3.82
West Virginia	3.76
Illinois Basin	3.77

*37°-37.9°.

Central Area

(Continued from page 174)

WESTERN KENTUCKY WILDCAT FAILURES

Daviess County: Basin Drilling Co. 1 Gillis, SE SW SE 19-P-28, dry, TD 1,926 ft.
Stanley Drilling Co. 1 Talbott, E½ NE NW SW 2-M-29, dry, TD 2,404 ft.
Henderson County: George & Wrather 1 Kimsey estate, E½ NW NE SE 23-G-24, dry, TD 2,484 ft.
G. A. Hoffman 1 Gates, NW SE SW 10-O-22, dry, TD 2,690 ft.

EASTERN KENTUCKY WILDCAT FAILURE

Elliott County: Ballard Lyons et al 1 Maude Click, South Ruin Creek, dry, TD 1,250 f.t. in Corniferous lime, salt water.

MICHIGAN SUCCESSFUL WILDCAT

Van Buren County, Bangor Township: Stuart R. Godfrey 1 Fragoules, SW SW NW 14-2s-16w, Traverse 1,045 ft., 5 bbl., TD 1,052 ft.

MICHIGAN WILDCAT FAILURES

Allegan County, Lee Township: Louis Zellman 1 Steinmiller, NW SW SW 18-1n-15w, Traverse 1,180 ft., dry, TD 1,200 ft.
Ionia County, Lyon Township: Byron MacCallum 1 Staley, SE NW NW 29-7n-5w, Dundee 2,804 ft., dry, TD 2,880 ft.
Newaygo County, Monroe Township: Naph-Sol Refining Co. 1 State-Monroe, NE SW NE 9-16n-12w, Traverse 2,635 ft., dry, TD 2,675 ft.
Van Buren County, Arlington Township: Oliver J. Hosier 1 Glista, SW SE SE 30-2s-15w, Traverse 1,045 ft., dry 1,668 ft.

Rocky Mountain Area

(Continued from page 175)

47n-89w, dry, TD 1,404 ft. Embar 735 ft., Tensleep 1,260 ft.

Weston County, South Clareton: Black Hills Drilling Co. 1 Shook, NW NW NW 27-42n-65w, dry, TD 6,687 ft., Muddy 6,320 ft., Dakota 6,517 ft.

COLORADO WILDCAT FAILURES

Logan County: Carl L. Brazell 1 Martin Dimery, NW NW SW 21-12n-53w, dry, TD 5,607 ft., Carlile 4,951 ft., Greenhorn 5,158 ft., "D" sand 5,399-5,449 ft., "J" sand 5,517-5,605 ft.
Morgan County: J. Ray McDermott & Co. 1 McClelland, NW SW SE 20-5n-59w, dry, TD 6,568 ft. "D" sand 6,085 ft., "J" sand 6,156 ft., "M" sand 6,444 ft., Morrison 6,485 ft.
Sedgwick County, SW Big Springs: Chas. D. Edmonson et al 1 L. C. Russell, SE SE NW 25-12n-45w, dry, TD 3,762 ft. Greenhorn 3,035 ft., "D" sand 3,236 ft., "J" sand 3,349 ft., Morrison 3,761 ft.

UTAH WILDCAT FAILURE

Uintah County, Castle Peak: Sun Oil Co. 1 Unit, NW NW SW 36-8s-17e, dry, TD 7,794 ft. Green River-Wasatch transition 5,980 ft., Wasatch 6,500 ft.

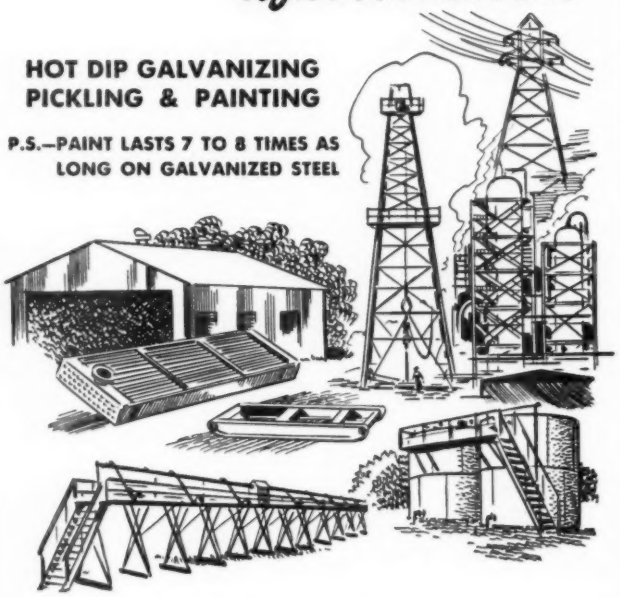
NORTHERN NEW MEXICO WILDCAT SUCCESS

Rio Arriba County: Blackwood & Nichols 1 Alsup, SW NE SW 18-30n-4w, IP 740 M.c.f. gas daily from Pictured Cliffs at 4,160 ft., TD 4,355 ft.

CUT CORROSION COSTS
Specify HOT-DIP GALVANIZING after Fabrication

HOT DIP GALVANIZING
PICKLING & PAINTING

P.S.—PAINT LASTS 7 TO 8 TIMES AS LONG ON GALVANIZED STEEL



NO JOB TOO LARGE

BOYLES

IT CAN'T BE TOO SMALL

BOYLES GALVANIZING COMPANY

3349 W. 5th St. TULSA, OKLAHOMA Phone 3-9158

H. C. Otis On Latin American Field Trip

H. C. Otis, president, Otis Pressure Control, Inc., and Otis Pressure Control Export Corp., has left the United States for an inspection trip to Latin-American oil fields.

During his 6-week tour, Otis will talk to management officials of operators in Maracaibo and Caracas, Venezuela; Port of Spain, Trinidad; Argentina; Chile; and Peru.

Otis Pressure Control Export has engaged in South American sales and service work for several years and has representatives and service facilities at Maracaibo and Caracas. Otis is expected to return to the United States about March 25.

Peerless Names Brisbois Process Pump Specialist

An announcement has been made by Peerless Pump Division, Food Machinery & Chemical Corp., of the appointment of Roy F. Brisbois as process-pump specialist. Brisbois will devote his time to pump application problems in refineries, chemical process, and industrial plants, coordinating his efforts with Peerless field engineers and distributors.

Brisbois has been with Peerless Pump Division for the past 5 years in sales work in the Pacific district. His headquarters will be at the company's Los Angeles plant.

EQUIPMENT MEN . . . in the News

Lane-Wells Celebrates 20th Birthday

Lane-Wells Co., a leading oil-field service company, celebrates its twentieth birthday March 19, 1952. Born in the depression the company pioneered gun perforating as an oil-field service, and in 1940 the company introduced radioactivity well logging.

R. S. DURKEE

W. T. WELLS

According to Rodney S. Durkee, president, Lane-Wells has completed more than 165,000 gun-perforating jobs and more than 40,000 radioactivity well logs. Acceptance by the industry of these services as standard practice in most producing areas has enabled the company to grow until today there are more than 1,400 employes in the field, shops, offices, and laboratories in the 78 branches maintained by the company in the United States, Canada, and Venezuela.

The more than 160 employes who have been with the company for over 10 years will be honored in the March 1952 issue of the Cablegram, the "Old Timers" number of the company's employe magazine. At the birthday celebration, Walter T. Wells, a cofounder of the company, now chairman of the board, will receive the first 20-year service award.

Homestead Announces Two Major Appointments

According to an announcement by F. E. Schuchman, president, Homestead Valve Manufacturing Co., the board of directors of the company has appointed Don H. Krey as vice president in charge of sales, and John W. Force as vice president in charge of engineering. Both appointments are effective for all of the company's three divisions, which include the valve plant, the Hypressure Jenny steam cleaner plant, and the chemical compounding plant in Edgeworth, Pa.

Graduates of Carnegie Institute of Technology, both men have worked up through the company's organization, and have been a part of the executive group during Homestead's greatest growth. Force made his start in the valve engineering department 26 years ago, while Krey joined the company in 1935.

Baker Establishes Williston Branch

Baker Oil Tools, Inc., has announced the opening of its new branch office and warehouse at Williston, N. D., to serve the Williston basin area. Ben Spingath, formerly of Baker's Casper, Wyo., district office, has been appointed Williston branch representative. Branch warehouseman is Gordon M. Anderson.

Prior to establishment of the Williston branch, Baker tools and services were made available to the area out of Baker's Casper facilities.

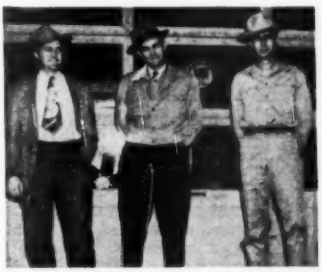
Diesel Power Named GM Diesel Distributors

Detroit Diesel Engine Division of General Motors has announced the appointment of Diesel Power, Inc., Plainview, Tex., as distributors for GM Diesel engines in the Texas Panhandle.

The new company will handle sales and service in the petroleum and industrial fields from headquarters in Plainview and through dealer outlets in Perryton and Friona, Tex.

The company is headed by Fred L. Manton assisted by L. H. Donnell, manager; J. W. Hamby, sales, and Leon Cloyd, parts manager.

Complete sales and service facilities are available at the three points with service cars also carrying complete stocks of parts. Bill Wilson Earthmoving Co. represents Diesel Power at Perryton, and the O. F. & O. Supply Co. is the dealer at Friona.



Diesel Power, Inc., personnel include: J. W. Hamby, sales; Landon H. Donnell, manager, and Leon Cloyd, parts manager.

Webster Is Chicago Branch Manager for Moore Products

Moore Products Co. has announced the appointment of H. C. Webster as manager of its Chicago branch office. He will be in charge of sales and service on both Nullmatic industrial instruments and Moore air gages in the four-state area around Chicago.

Prior to his appointment, Webster was a sales engineer in the company's Detroit branch office.

Otis Pressure Names Four Appointments

C. M. SCHWAB

D. E. DAFFIN

F. A. RODGERS

GUY GANT

Otis Pressure Control has announced the appointment of Carl M. Schwab as service manager with offices at the company's headquarters in Dallas. His duties will include the supervision of all Otis wire line, tubing, and service operations.

Schwab started with Otis in its Houston division as a corrosion engineer in the tubing calipering department. Later he was in charge of the company's New Iberia division for southern Louisiana and Mississippi operations.

Prior to his Otis assignments Schwab was a field engineer for Stanolind Oil & Gas Co. and later petroleum engineer in charge of offshore construction for Stanolind's South Louisiana division. Schwab's oil-field service dates back to 1934 when he began roughnecking in Sour Lake, Texas, field.

Three other appointments have also been announced by the company. D. E. Daffin, Houston division, has been

named Gulf Coast area manager in charge of the firm's service operations in South and Southwest Texas, southern Louisiana, Mississippi, and Alabama. F. A. (Jack) Rodgers, Houston, has been appointed South Texas division manager, and Guy Gant, South Texas division superintendent. Each of these men has been affiliated with Otis for several years.

The new Gulf Coast service department will centralize operations in Otis' Houston; Corpus Christi, Tex.; Falfurrias, Tex.; Houma, La.; and Victoria, Tex., districts.

In another release Otis Pressure Control has advised of the opening of a new district office in Shreveport with Ernest Fenton as operator in charge. The new office is under the supervision of Bob L. Crain, manager of Otis' Longview, Tex., division office.

National Names Stephens To Gulf Coast Position

J. B. STEPHENS

John B. Stephens has been appointed tubular manager of The National Supply Co.'s Gulf Coast division, as announced by John W. Babb, division manager at Houston.

Stephens has been associated with National since 1939, when he entered the general sales office in Toledo. His early career with the company took him to Clay City, Ill., and then to Corpus Christi, Tex., as field salesman from 1940 to 1943.

In January 1943 Stephens was transferred to Dallas, and 4 years later moved to San Antonio, as sales office manager. He was assigned to Houston in May 1949 as city salesman, which position he held until his recent appointment.

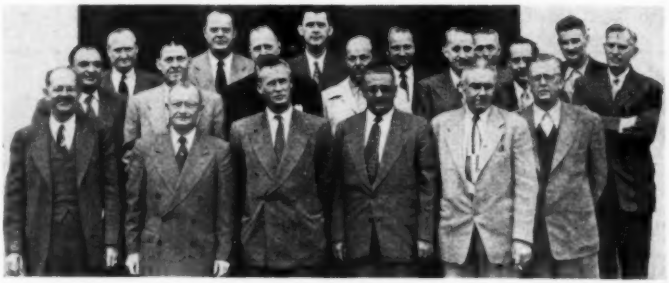
Southwest Supply Elects Burk Vice President

Richard M. Burk has been elected vice president of Southwest Supply Co., according to a recent announcement. He will be in charge of new offices in Denver, established by the company to serve the Rocky Mountain area.

Burk has previously been identified with The National Supply Co. for more than 23 years, where he served in various sales and executive capacities.

He was assistant to the vice president of The National Supply Co in Torrance, Calif., from 1940 to 1943. In his last position with the company, he was manager of sales for seamless products of the Spang-Chalfant Division.

Grove Regulator Field Staff Holds Annual Meeting

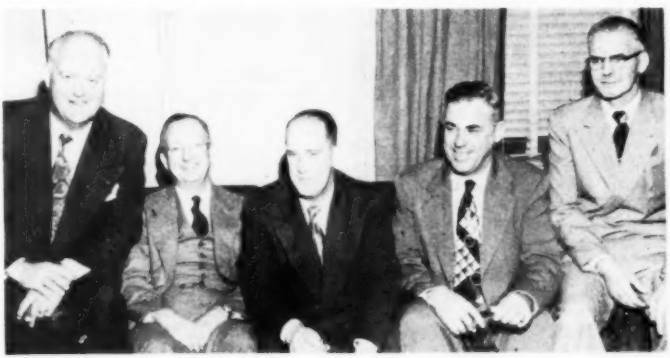


Grove Regulator Co. executives and district field representatives who attended annual sales meeting were, front row: E. H. McMenemy, office manager, Houston; C. W. Garrison, office manager, New York; J. A. Records, district engineer, Lafayette, La.; J. D. Hicks, Corpus Christi, Tex.; L. D. West and George Doty, Emeryville. Second row: A. V. Bryant, chief engineer, Emeryville; L. R. Van Arsdale, Tulsa; L. S. Robb, Dallas; W. H. Orth, Los Angeles; K. F. McIntire, H. A. Ward and M. H. Grove, Emeryville. Back row: C. B. Truitt, Southwestern division sales manager, Houston; W. G. Folsom, Odessa, Tex.; J. A. Mattson, New York; J. W. Collins, E. E. Mann and H. Wolpman, Emeryville.

Grove Regulator Co. plant at Emeryville, Calif., was the scene of the firm's annual sales meeting held in early January. Joining with Grove executives at the 3-day sessions were 20 field sales representatives from the company's district offices in New York, Louisiana, Oklahoma, Texas, and southern California.

Discussions led by M. H. Grove covered all phases of Grove valves, regulators, and controls used by petroleum and gas industries. Emphasis centered on new products, availability of materials, and general sales policies.

Foreign Visitors at Los Angeles Nomad Meeting



In attendance at a recent Nomad's stag dinner in Los Angeles were: Hearn J. Paschall, export manager, H. C. Smith Oil Tool Co., Compton, Calif.; Mike Bush, drilling superintendent, "Cima," Mexico; Harry F. Simons, secretary, A-Z Export, S. A., Maracaibo, and Puerto la Cruz, Venezuela (exclusive representative for H. C. Smith Oil Tool Co.); William C. Fields, petroleum engineer, Richmond Exploration Co., Maracaibo, Venezuela, and Kent Garner, drilling superintendent, Santa Fe Drilling Co., Tunisia.

Chiksan Appoints Thomas Manager Sales Development

The creation of a new sales development department in the Chiksan Co. has been announced by G. R. Winder, vice president.

E. Nelms Thomas, formerly assistant manager of the sales promotion division of Commercial Solvents Corp., has been appointed manager of the new department and will make his headquarters at the company's main plant in Brea, Calif.

This new department was established to integrate the expanding sales promotion activities of the company. Among the department's major functions will be the handling of the advertising and sales promotion programs, sales analysis, and market research.

(Continued on page 187)

Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY...

CLASSIFIED ADVERTISING

UNDISPLAYED CLASSIFIED 15c a word one issue. 10% Discount three or more consecutive issues. $3.00 minimum charge. Blind Box in our care nine words. Payable in Advance.

DISPLAY CLASSIFIED
$12.00 a column inch one issue . . .
10% Discount three or more issues.

Address Classified Advertising Material: The Oil and Gas Journal, P. O. Box 1260, Tulsa 1, Okla.

EQUIPMENT FOR SALE

FOR SALE by Owners—Complete Rotary Rig ready to drill; located Illinois; RL Cardwell Drawworks; 87-ft. Lee C. Moore Derrick; Wilson-Snyder Pump; Waukesha motors; Brewster Swivel; Gumbo Buster Table; 3½" Mod. Drill Pipe; 1951 Willys 4-wh. dr. 1-ton Pick-up truck; Also working interest sand well 46-acre lease. Address F. Heldt, Mt. Carmel, Ill., or Tel. 801—1120.

USED rotary and cable tool drilling tools wire lines. E. A. Kelly, Box 861, Oklahoma City. Phone 5-6407

FOR SALE: Wilson Giant Draw Works with 2-JL-1335 Buda Motors compounded, motors recently overhauled and in A-1 condition. Total price $7,500.00. Glenn R. Nye Drilling Company, Drawer 30, Telephone 897, Hays, Kansas.

7500' OF API Full Hole 4½" Drill Pipe Graded and tested by Sonoscope engineers Milford Giffin, Giffin Hotel, Tel. 477, Hoisington, Kansas

Gaso Duplex 4½" x 6" Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units Westinghouse 20-25-50 KW Generating Units

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 132—Rockdale, Texas
AT-3427—Houston, Texas

FOR SALE NEW
2—Diesel Electric Generating Units
Caterpillar D-8800 50 KW Continuous Rating. Mounted on steel base complete with radiator, control cabinet, silencer, electric starting and safety shutoff devices. Communicate with
ARTHUR C. SIMMONS
Box 191, Bradford, Penn. Phone 3148

Seamless Jet Pipe
Seamless Jet Pipe
Seamless Jet Pipe

Standard black seamless jet pipe, threaded & coupled with long recessed tubing collars.

75,000'	1"	1.67#	14' — 22'	Lengths
50,000'	1¼"	2.27#	14' — 22'	Lengths
25,000'	1½"	2.69#	14' — 22'	Lengths

Other Pipe too!

Complete Stock ½" to 36"
Standard Extra Heavy and Double Extra Heavy.

Telephone, Wire or Write

J. M. HAUCK
5543 Ashland Ave., St. Louis, Mo.
Telephones:
Day, GRand 6434 Night, COlfax 9145

EQUIPMENT FOR SALE

PIPE
All sizes; line pipe and casing, tanks, and Oilfield supplies. Edco Pipe & Supply Co., Phone 45070, P.O. Box 151, Tulsa, Oklahoma.

FOR SALE: Our Sasakwa Gasoline Plant only, "no field lines" now ready for disposal. Inventory and price available upon request. Cities Service Oil Company, Patridge, Bartlesville, Okla.

ELECTRIC Generator Units: Immediate delivery on 3 KW, 6 KW, 10 KW, and 12 KW diesel units and 10 KW gas-gasoline-butane; all new Buda units, 125 volt DC, metal housed. Also new 125 KW, 900 RPM, 240/480 volt, 3 phase units with Buda convertible diesel or natural gas-butane engines. Buda Engine Sales & Service, 517 West Archer, Tulsa, Oklahoma.

ROTARY TOOL JOINT GAUGES

6 Pratt & Whitney (API)
Rotary Tool Joint Certified Master Gauges.

13 Pratt & Whitney (API)
Rotary Tool Joint Working Gauges.

Practically all above brand new.

ATLAS STEEL PRODUCTS CO.
1311 Niels Esperson Bldg.
Houston, Texas
BL. 6658

EQUIPMENT FOR SALE

FOR SALE: Well Drilling Business—71-Star, Modernized #3 Keystone, Both Truck Mounted. Complete Tools, 4 to 20 inch. Physical Inventory $15,000. Nets $6,000 to $8,000 yearly. This is Industrial—No Pipe Worries. Sales Price: $11,000.00. Owner retiring. Write Box E-594, The Oil and Gas Journal, Tulsa, Oklahoma.

10,000-FT., 5½-inch J-55 seamless casing shopped and tested. 10,000-Ft., 2-inch external upset tubing in excellent condition. 2 Bethlehem pumping units complete, 5,000 ft. capacity. P.O. Box 4343, Dallas, Texas.

FOR SALE!
USED LINE PIPE

10,000 ft.—	4" OD x .188" wall—7.63# E.W. line pipe P.E.—D/R/L
12,000 ft.—	8⅝" OD x .203" wall—18.27# L.W. line pipe P.E.—S/R/L
3,300 ft.—	18" OD x .375" wall—70.59# E.W. line pipe P.E.—S/R/L
6,300 ft.—	18" OD x .406" wall—76.34# E.W. line pipe P.E.—S/R/L
4,600 ft.—	20" OD x .312" wall—65.71# E.W. line pipe P.E.—S/R/L

Also, used oil country casing and tubing suitable for line pipe. Priced under OPS—CRP 98—subject to prior sale and inspection. Located in Ohio.

THE SANDY SUPPLY COMPANY
Wooster, Ohio, Phone 173
Zanesville, Ohio, Phone 2-8766

DISMANTLING GASOLINE PLANT

7—CLARK GAS ENGINE GAS COMPRESSORS

One—230 H.P.—17x18x26x20
One—230 H.P.—17x18x24x20
One—230 H.P.—17x18x24x20
One—200 H.P.—16x7½x10x20
One—165 H.P.—17x6½x16x20
One— 80 H.P.—16x8½x20
One— 80 H.P.—16x7½x20

Complete and in good operating condition.
Full specifications available on request.

PROPANE and BUTANE STORAGE TANKS

TOWERS — VESSELS — PUMPS — BOILERS

INSTRUMENTS — PIPE — VALVES — FITTINGS, Etc.

This plant located near Benton, Illinois, ceased operating a few months ago due to shortage of natural gas.

Write for descriptive folder listing hundreds of other items.

BROWN - STRAUSS CORPORATION

P. O. Box 78
Kansas City 10, Mo.

Norman Strauss
Phone HArrison 1000

Salesman on premises. Contact R. V. Crisp, Phone 1419 or 610, Benton, Ill.

EQUIPMENT FOR SALE

FOR SALE: U-34 Unit Rotary Rig, C-150 pump, 5½' substructure, Lee C. Moore mast, 4200' of 4½" drill pipe, all complete, A-1 condition, eleven months old. H. Waggoner Drilling Company, Box 4657, Oklahoma City, Okla.

AIR COMPRESSORS: Davey Model 160 V.D., 160 cu. ft., International Diesel powered; $2,250.00. Chicago Pneumatic, 160 cu. ft., Hercules Gasoline powered; $1250.00. Located Tulsa. Midwestern Drillers, 628 Wright Bldg., Tulsa, Oklahoma. Phone 4-5263.

1500—STANDARD Couplings for 8⅝ OD line pipe, 8V thread—good condition. 10,000 feet—5½ OD PE line pipe. Good condition. Lee Morrison Supply Company, Phone 277, Bartlesville, Oklahoma.

FOR SALE

Reconditioned Drilling Rig Complete. Consists of the following: Wilson double drum giant model drawworks, driven by EKU Waukesha gas engine. FXZ Gardner-Denver power pump driven by model NKU Waukesha gas engine, pump and engine unitized on sub base with V-Belt drive and guard. Double 87 ft. telescoping mast pole with racking platform for 5000' 3½" drill pipe. Oil Well model 100 swivel; 17½" oil bath rotary table with bushings; 5000' 3½" drill pipe; six 5¼" x 2¼" x 27' used drill collars; 5KW light plant; Brewster H-100 combination hook and block; 4¼" x 37 ft. kelly.

All necessary fittings and hand tools to complete drilling rig. Rig may be inspected at Empire Machinery Company in Odessa, Texas. For further details, Write—Wire or Phone.

EMPIRE MACHINERY COMPANY

Box 4028 — Phone 6-9161 — Odessa, Texas

IMMEDIATE SHIPMENT!

NEW STEEL PIPE & TUBING

Carload and LCL Lots

- **TESTED Electric Weld TUBING 4" OD x 14 ga.**

FOB CHICAGO & PITTSBURGH

- **TAYLOR FORGE Spiral Weld PIPE**

6⅝"-8⅝"-10¾"-12¾" x 10 ga. wall

FOB HOUSTON, PITTSBURG, CHICAGO, NEW YORK

- **Electric Weld PIPE—P.E. ASTM spec. A-252-46**

Pipe for Piling

8⅝" OD x .188-.219-.250-.277-.322
10¾" OD x .188—12¾" OD x .219-.250-.281

FOB OUR WAREHOUSES

FIRST CLASS USED MATERIAL

FOB CHICAGO WAREHOUSE

- **CAST IRON PIPE**
  - 187 pcs. 10"
  - 1036 pcs. 12" Class 150, 18', B & S
  - 153 pcs. 18" Class 100, 16'—Mech. jt.
  - Large Asst. of Fittings and FIRE HYDRANTS
- **BLACK PIPE Reconditioned**
  - 100 tons—2" standard Steel Pipe
  - 125 tons—1¼" Ex. Hvy. Wrought Iron Pipe
- All material subject to prior sale. Offered to end users only.

In replying—Mention this ad.

L. B. FOSTER CO.

1721 Commerce Bldg. Houston 2, Tex.
PITTSBURGH 30, PA. CHICAGO 4, ILL.
NEW YORK 7, N. Y.

EQUIPMENT FOR SALE

SALES and Rental of Cable Drilling and Fishing Tools. Casing and Equipment from the Southwest's largest stock of used Cable Tools. Degen Pipe & Supply Co., Tulsa, Oklahoma.

FOR SALE: 87' Lee C. Moore Cantilever Mast, Complete with 3' 10" Substructure. Melton Supply Co., Seminole, Oklahoma.

FAILING 5500 Rig, 40 ft. Derrick, Rotary Pump mounted K8 International Truck, 1,038 ft. 3½ Drill Pipe, 48 Chevrolet Truck, trailer, 30 bbl. water tank. Rig complete at Coleman, Texas. $17,500.00. The Oil Corp., 1005 Wilson Bldg., Corpus Christi, Texas.

FOR QUICK SALE!

SEAMLESS STEEL LINE PIPE

HYDROSTATIC TEST 1000# P.S.I.

Excellent for Oil, Gas or Water Flow Lines.

A considerable portion of this stock is new and unused. The remainder is reconditioned but has never been underground, and is uniformly smooth and free of pits.

75,000'	2"	OD x .120"	wall	2.73#
75,000'	2¼"	OD x .120"	wall	3.09#
50,000'	3¼"	OD x .134"	wall	4.50#
50,000'	3½"	OD x .134"	wall	5.50#

Double Random Lengths

Other Pipe, too! Complete Stock ½" to 36" Standard Extra Heavy and Double Extra Heavy.

Telephone, wire or write

J. M. HAUCK

5343 ASHLAND AVE., ST. LOUIS, MO.

Telephones:
Day, GRand 6434 Night, COlfax 9145

PRESSURE VESSELS

1—4'-0" x 40'-0" Reaction Chamber, Wall Thickness 4 inches—Forged Steel Construction—GUNITE LINED.

1—5'-0" x 32'-6" x ⅞" Riveted & Welded Tower—5 trays spaced 20" Apart.

1—5'-0" x 30'-0" x ⅜" Riveted & Welded Tower with Tulsa Type Mist Extractor, 10 trays—spaced 20" apart.

1—6'-0" x 28'-0" x ⅜" Riveted Tower, 16 trays—spaced 16" apart.

2—9'-2" x 39'-0" x 1⅛", Riveted & Welded Vessels.

2—10'-0" x 30'-0" x ½" Riveted Stills.

1—10'-0" x 39'-9" x ⅛" x 1" Heads—Riveted Tower. 3 trays—63 C.I. Bubble Caps each—also 3 Baffle Plates.

BROWN-STRAUSS CORPORATION

NORMAN STRAUSS
Phone HA-1000
P. O. Box 78
Kansas City, Mo.

EQUIPMENT FOR SALE

FOR SALE: One St. Regis Type 301 FB Valve Bag Filling Machine equipped with guards, solenoid tripping device for cutoff valve. Machine approximately 18 months old and has had very little use. Original cost $2750. If interested call or write Husky Oil Company attention of C. A. Colbern, Box 380, Cody, Wyoming, or telephone Cody, Wyoming, 500.

FOR SALE: One 125 H.P. Allis-Chalmers 1170 RPM 220 Volt, 31 Amphere, Type A.R. code F. 3 phase, 60 cycle, 24 hour, 40 degree rise induction electric motor. Never used. In original crate, priced at $1500.00. Located Cushing Refinery, Cushing, Oklahoma. Contact Huitt, Deep Rock Oil Corporation, Box 1051, Tulsa, Oklahoma.

BUCYRUS-ERIE 24-L complete with all tools, lines, doghouse, water pump, light plant, 1½-ton truck and pipe trailer. Located near Robinson, Illinois. Write or call Buckeye Supply Company, Zanesville, Ohio

C-37 WALKER-NEER Spudder, complete with 8,000 ft. lines, dog house, lights, 5 & 7 inch tools, control head, etc. Work-overs to 10,000 ft. First class condition. Reasonable. West Texas. Box E-629, The Oil and Gas Journal, Tulsa, Oklahoma.

MODEL Super H. Fort Worth Spudder, all steel A-mast; D-4400 Caterpillar Diesel; Sand line; 3 drilling cables; 2 drilling stems; 7 bailers; 9'—8'—6' Long bits; Low boy to move machine; 4x4 Chevrolet truck. Fishing tools; Blocks, elevators, and hooks; Light plant, forge, water pump and waterline; all in good condition. James S. Lytle, 216 Ritz Bldg., Tulsa, Oklahoma.

360 HP. Hedges-Walsh-Weidner Steel Sectional Header Cross Drum Boilers, integral furnaces, 262# WP, ASME, ideal for outdoor setting. Complete steel shell. Price: $8500 each. United Steel Products Co., 1534 Texas St., Memphis, Tenn.

200 HP. GE Induction Motor 3/60/2300, with grids, starter, switch, connected to 2000 GPM Goulds Pump, 8", 230' head. Price: $1850. Also: Sterling Dolphin Gasoline Engine, 225 HP., 1500 RPM, directly connected to F-M Centrifugal Pump 8", 2000 GPM. 45 hours since complete overhaul. $1500. United Steel Products Co., 1534 Texas St., Memphis, Tenn.

FOR SALE: The following New Material at ½ Retail Price. 8 6" FE 90° Base Elbows Ser. 600 Cast Steel Fittings. 4 8" FE 90° Ser. 400 Cast Steel Fittings. 4 10" FE Ser. 300 Cast Steel Fittings. If interested contact Mr. Bert Rogers, Texon, Texas.

WELL Drilling Rotaries and Spudders, bought and sold. Immediate delivery in most cases. Specify your requirements. Contact Francisco Gonzalez, Baker Export Co., Box 1128, Pecos, Texas.

VALVES: Gate valves from refinery, rising stem 4" each $30, nonrising stem 4" for $25, rising stem 6" each $35, nonrising stem 6" for $30, some other sizes. Also master valves, control heads, pump jacks, upset tubing. Good used equipment. Everything for well service. Pressey & Son, Pueblo, Colo.

USED well drilling equipment. We buy and sell spudders, rotaries, core drills, tools, pipe, blocks, pump jacks, everything for well drilling and service. All used equipment fully reconditioned. Contact us for your requirements and save money. We rent fishing tools. Pressey & Son, Pueblo, Colo.

FOR SALE

1, Franks Model SAL 5000 Rotary Rig, and sub-structure complete, in good condition, equipped with 3 new gas engines, including 5500 ft., 4½-in. drill stem. 3 Oilfield trucks and 3 trailers. Immediate possession, including drilling contract if desired. TERMS. Also have Oil leases in Colo., Wyo., & Nebr., for sale or farm-outs and some royalty in Colo., and Nebr.

Phone or write

SUHR, FIEDLER, LOCK DRILLING CO.
Holyoke, Colo.

EQUIPMENT FOR SALE

FOR SALE AT BARGAIN: Heavy Duty Pumping Unit for handling large volume fluid. Parkersburg J-53-30, double reduction Herringbone gear reducer complete with Buda JL-877 Standard unit with accessories. Motor newly reconditioned. Unit about seven years old but actually in use only short time. First class condition. Now located near Cromwell, Oklahoma. Wrightsman Oil Company, 218 First National Bank Building, Holdenville, Oklahoma.

EQUIPMENT WANTED

WANTED TO BUY: Tubing threader, must be in good condition and reasonable. Western Well Service, Odessa, Texas.

1,400 FEET or less 3½" EUE or 2⅞" EUE drill pipe, new or good used. One 30 foot 4¾" drill collar, new or good used. Have PAD authorization for pipe. Box E-606, The Oil and Gas Journal, Tulsa, Oklahoma.

WE BUY well drilling equipment, machines, cable tools, pipe, etc. Turn your surplus equipment into cash. Pressey & Son, Pueblo, Colorado.

WILL PAY highest prices for used casing, used line pipe, abandoned leases, or other surplus lease equipment. Your idle producing equipment is worth dollars. Green Pipe & Supply Co., Box 1383, Tulsa, Oklahoma.

WANT TO HIRE—Some one to drill 1,000 foot oil test, or will buy small rotary. Lewis Short, Burrton, Kansas.

WANTED FOR CASH

Oil Well Type Motors in ratings 15/30-20/50-25/65 or 35/75 Horsepower. Will buy other type motors.

ALLIED ELECTRIC & MACHINERY CO.
1007 Falls Bldg., P.O. Box 1838
Memphis 1, Tenn.

MANUFACTURERS REPRESENTATIVE

INDUSTRIAL sales engineer, with established office in Cleveland, desires to represent producers in the sale of fuel oil and L-P gas in tank car lots in Ohio and adjacent areas. Write to, Box E-650, The Oil and Gas Journal, Tulsa, Okla.

LONG established small but effective organization in California oil industry desires additional line of equipment preferably in engine or other machinery field. Can function as manufacturer's representatives or dealers. Box E-598, The Oil and Gas Journal, Tulsa, Oklahoma.

BUSINESS OPPORTUNITIES

WANTED: $50,000 to develop and mine lead, silver and gold ore from Colorado mine with past production in excess of $100,000. Possibility of many million tons of ore is indicated from past explorations and geological evidences. Box E-650, The Oil and Gas Journal, Tulsa, Oklahoma.

Experienced Consulting Geologist and engineer thoroughly familiar with Oklahoma oil prospects and with the ability to handle leasing, drilling, development and operation of oil properties, desires connection with an individual or group of individuals who will finance a drilling program. Will operate on an interest plus a retainer. Can get results. **Box E-644, The Oil and Gas Journal, Tulsa, Oklahoma.**

WANT
N. Y. EXPORT REPRESENTATION?

Long established and well known oil well equipment manufacturer who has maintained N. Y. export office and sales personnel for many years, is now in a position to handle additional representation in New York for high quality manufacturers of oil equipment items. If you're looking for increased export business, write for further information. All replies held in strict confidence.

Box E-359, The Oil and Gas Journal, Tulsa, Oklahoma

HELP WANTED

ADMINISTRATIVE and field sales personnel. Engineering education and/or background necessary. Knowledge of petroleum and chemical industries desirable. Apply: The J. B. Beaird Company, Inc., P.O. Box 1115, Shreveport, Louisiana.

GEOLOGIST to organize, and to direct Geological Department for exploration, and production Div. now being organized, for a well established Natural Gas Co. Must be thoroughly familiar with South Louisiana, and also experienced in North Louisiana, Mississippi and East Texas, and capable of handling the geology in other areas in which the company may want to expand. Salary commensurate with ability and job to be done. Office in New Orleans, Louisiana. Box E-645, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Chief Engineer, preferably one who has had at least six or more years in refining with some asphalt and processing engineering experience to take charge of maintenance and new construction. Location Northeast Texas. Box E-558, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL INDUSTRY Employment Service, 405 Tuloma Building, Tulsa, Okla. 4-5974, Tom Robinson, owner. For technical and trained oil industry personnel. No fees.

PETROLEUM ENGINEER OR GEOLOGIST

with broad general knowledge of the petroleum industry in East Texas, North Louisiana and South Arkansas, to fill position with well established firm in area. State qualifications in detail.

Box E-614, The Oil and Gas Journal, Tulsa, Oklahoma

REFINERY OPERATORS

Expanding major gulf coast oil refinery has openings for experienced refinery process operators. Progressive company with attractive benefits. Requires 2-4 years operating experience on major refinery units. Good opportunity for experienced Helpers to become Stillmen. Housing available within immediate area. Reply giving detailed experienced, age, education and wage expected. Replies treated confidentially.

Box E-647, The Oil and Gas Journal, Tulsa, Oklahoma

MANUFACTURERS REPRESENTATIVE or SIDELINE SALESMAN WANTED

calling on the oil industry and supply houses to represent large manufacturer of Wiping Rags and Cotton & Wool Waste.
We offer a marvelous Opportunity to the right man with a following. Top commissions paid. State what territory you now cover. Exclusive territorial rights can be arranged. This is a high quality competitive line. Well known brand. Give full information 1st letter.

COLUMBIA WIPING CLOTH COMPANY
1720 Wabash Kansas City, Mo.

PETROLEUM ENGINEERS

Major Oil Company has openings for a number of Petroleum Engineers for service in South America & Middle East. Requirements: B.S. degree in P.E., M.E. or Chem.E.; to 3 yrs. Experience.

GULF OIL CORPORATION
Foreign Production Div.
P.O. Box 35, N.Y. 4, N.Y.

HELP WANTED

COMPUTER—College degree and two years of experience as Computer and Observer on seismograph crew. To be given intensive training toward position of Party Chief. Write us giving full details of education and experience and salary expected. Geotechnical Corp., Box 7168, Dallas, Texas.

KEY Seismograph Personnel Needed by Established and Expanding Scismograph Company. Box E-616, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE Chemical, Process, or Refining Engineer for plant control work in major Oklahoma Refinery. Catalytic cracking and alkylation experience preferred. Shift work required. Supervisory ability essential. State qualifications and salary expected. Write Personnel Department, P. O. Box 381, Tulsa, Oklahoma.

GEOLOGIST with three to five years experience, for subsurface mapping in West Texas, Panhandle, and Southwest Texas. Subsurface experience desirable but not necessary. Write giving training, experience and salary desired. J. F. Hansard, Personnel Director, Lion Oil Company, El Dorado, Arkansas.

STRUCTURAL, Mechanical, Piping, Electrical and Civil Draftsmen needed by major Pipe Line Company in Tulsa, Oklahoma. State age, education, experience, and salary expected. Steady employment to capable men. Box E-638, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED Engineers, Geologists, Draftsmen, Geophysical field men, write for information on Rocky Mountain positions now open. Professional Placement Service, 516 University Bldg., Denver, Colo.

COMBINATION, cable and rotary, sober and industrious driller year round work, good pay. Gray Well Drilling Co., Delafield, Wisconsin.

SITUATIONS WANTED

ADMINISTRATIVE Assistant who knows from experience what makes the oil and gas industry tick. College degrees in business administration and law, with graduate work in industrial engineering. Thorough knowledge of corporation finance and industry regulations. Will go anywhere U.S.A. Box E-652, The Oil and Gas Journal, Tulsa, Oklahoma.

MAN 49 years of age desires position as supervisor railway tank car maintenance, approximately 28 years of experience. At present shop superintendent large repair shop. Box E-630, The Oil and Gas Journal, Tulsa, Oklahoma.

FIFTEEN years experience in Gas Accounting, Measurement, Contracts, Personal Contacts. Junior Executive, age 37, desires change. Excellent references. Box E-631, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST: Six years seismic and subsurface experience, desire future with small company located southwest. Box E-633, The Oil and Gas Journal, Tulsa, Oklahoma.

LAND AGENT with right-of-way experience desires position. Presently employed by natural gas concern. Veteran, 26, married, college degree. References. Box E-635, The Oil and Gas Journal, Tulsa, Oklahoma.

17 YEARS Oilfield Experience—Drilling and Production as well as Technical and Management. Desire connection with stable independent. Prefer Rky. Mtn. area. Box E-632, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY MANAGER, extensive experience, desires connection with independent company. Box E-601, The Oil and Gas Journal, Tulsa, Oklahoma.

SUPERINTENDENT or Chief Engineer job, petroleum engineering degree, experience in production and completion work. Age 34. Box E-649, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No 131, Ph. No. 131, Hobbs, New Mexico.

SITUATIONS WANTED

15 YEARS experience in drilling and production supervision. Desire position with independent oil company. Furnish references. Box E-648, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM GEOLOGIST: Well established, seeks connection with active Independent in West Central Texas area. Retainer or full time basis. Box E-626, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer and Production Executive with wide experience in Domestic and Foreign Fields, desires affiliation with aggressive Independent. Box E-633, The Oil and Gas Journal, Tulsa, Oklahoma

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing. Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa, Oklahoma.

FOR SALE—MAPS

PERMIAN BASIN WILDCAT MAP OF WEST TEXAS & SE NEW MEXICO. Scale 1"—64,000'. March issue now ready. Just like a newspaper—a quick glance and you know what's happening in the Permian Basin. Revised monthly. Single copy $3.50. Midland Map Company, Box 1211, Midland, Texas.

REAL ESTATE

WILL LEASE 5000 Feet of Floor Space in New Building to be erected by June 15th on Trackage in City Limits to Oil Company wishing 5 year Lease or More. Also Available, in City Limits, Plot of Ground 165 Ft. x 212 Ft. For Details, Call—Wire or Write to E. B. Merritt, Inc., Box 605, Phone 60, Williston, North Dakota.

JUST what you've been wanting for that Summer home, year-around retirement home, tourist court, dude ranch or model hotel. We have 40 acres adjoining beautiful Manitou Springs, Colorado. Just right for developing to suit yourself; not too rough or hilly, but just the right location for the most panoramic views, and with secluded valleys, stately pines and beautiful building stones. A real bargain at $18,000. G. W. McLaughlin, 3506 West Pikes Peak, Colorado Springs, Colo.

FOR LEASE

OFFICE SPACE

OKLAHOMA CITY

Up to 50,000 sq. ft.

Main at Walker

air-conditioned

Fire proof

Inquire

SCHONWALD

718 N. Broadway

Oklahoma City

Phone Regent 6-5153

ROYALTIES

MONTANA ROYALTIES
Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1229, Great Falls, Montana.

LEASE AND DRILLING BLOCKS

JAMES A. ROSE Leases & Royalties, Williston Basin and other areas. 313 Colorado Bldg., Denver, Colo. Ph. KE 7354.

2000 ACRES Wayne County, Illinois; hot spot of Illinois Basin. 100 to 500 acre blocks. Want drilling proposition. Prefer Cable Tool Rig capable of 3500 ft. Address P. O. Box #339, Mt. Vernon, Ill.

270 ACRES in Hogshooter Pool, Washington County, Oklahoma. Successful waterfloods nearby. Core on piece shows good flood recovery potential in Bartlesville Sand at 1100 feet. Will give 13/16 lease on coring option to party willing to develop. Box 230, Bartlesville, Oklahoma.

CAPITAL immediately available for geologically attractive Drilling Deals, Oil Producing Properties, Producing and Non-Producing Royalties. Send full particulars. Box E-622, The Oil and Gas Journal, Tulsa, Oklahoma

NEW MEXICO Oil and Gas Leases for sale. 2100 Acres, Chaves, Eddy, Roosevelt, Valercia Counties. Box E-651, The Oil and Gas Journal, Tulsa, Oklahoma.

2½% ROYALTY 160 A. Between shallow gas wells and deep oil well, Big Piney, Wyoming. $1,000 takes it. R. O. Barnsley, 950 Lincoln Ave., Palto Alto, Calif.

INVESTMENT funds wanted—From excess taxpayers by independent oil operator. For exploratory well drilling immediately. Geologically favorable. Illinois basin. Box E-569, The Oil and Gas Journal, Tulsa, Oklahoma

OIL INVESTMENT Opportunity: Reputable oil operators in the Illinois and Indiana Basin propose and offer a unique investment opportunity. An exploratory program of ten wells is planned for 1952. These tests to be drilled in blocks with the best geological and geophysical background. Locations to be double checked by independent geologists. One Hundred Thousand Dollars will be required to carry out this program. We will back up the program with an investment on our part of not less than ten thousand dollars and up to twenty if necessary. Bank references furnished. If interested in such "Package" drilling deal and financially able to invest a minimum of five thousand dollars in this search for oil please write for further information. Box E-643, The Oil and Gas Journal, Tulsa, Oklahoma.

WILL pay cash instantly for leases (large blocks), royalties, mineral deeds, production. Write fully—P. O. Box 2153, Denver, Colorado.

2000 ACRE Block, Centers 19-13N-19E Muskogee County, Oklahoma; lays on high side, 600 feet, Keefeton fault; 3 Dutcher Sands, Wilcox. Completed well, First Dutcher, 650 feet, 280,000 Cubic feet, ready for market. Immediate sale, Phone 1258, Seminole, Oklahoma.

FOR SALE at reasonable price: Good non-producing overriding royalty on large block San Juan basin area—early drilling indicated by substantial independent lessee.

Box E-645, The Oil and Gas Journal, Tulsa, Oklahoma.

NORTHWESTERN NORTH DAKOTA LEASES AND MINERALS

Our latest lists with prices, mailed on request. Will also buy acreage where you want it. Any place in Northwestern North Dakota. References exchanged.

BORSTAD & FITZMAURICE
Oil Properties
4th Floor 1st National Bank Bldg.
Phone 40-226 Minot, North Dakota

LEASE AND DRILLING BLOCKS

FOR SALE: Oil and Gas Leases and Drilling propositions in Shallow territory of South Central Kentucky. Logs of wells furnished. W. P. Harley, Bowling Green, Ky.

HAVE 400 acres oil lease that will produce shallow oil. Viola lime 1520 ft., Wilcox 2570 ft. Will turn for 1/16 override. SEC. 8-2S-8E. W. J. Rogers, Connerville, Okla.

PARTIES interested in most desirable locations to drill for oil and gas on new or old leases under straight-and-cross-line system send maps and full data of wells drilled. Maps will be returned with markings. No charge. Box 705, Jamestown, N. Y.

FOR a limited time NEW CAPITAL for operators or for purchase. If you have production and need new "easy term" working capital to refinance obligations, drill more wells, expand, or desire to sell, contact us for details. In reply don't give details—merely state size of lease, number producing wells, daily pipe line runs and whether prorated. Don't sacrifice before you contact us. Box E-624, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASES ROYALTIES
Producing and Nonproducing
Bought and Sold—Any Area
Inquiries Invited

B. D. BUCKLEY
4635 Delmar Ave., St. Louis 5, Mo

WANTED TO BUY

real oil production from owners only. Won't assume overriding royalty. Please quote net price. Principals only.

Box E-628, The Oil and Gas Journal, P. O. Box 1260, Tulsa, Okla.

NORTH DAKOTA
LEASES and MINERALS

Our latest lists with prices mailed on request. We solicit only those connected with the Oil Industry, or Royalty business. References exchanged.

JOHN ALLEN
200 Grand Pacific Hotel Phone 3858
Bismarck, North Dakota

GET IN ON A "MAJOR" PLAY!

Major Oil Companies and a large number of progressive independents are making a great lease play in certain areas of Western Kansas, and we have some well located leases and royalties right in with and under the big company spreads. Here is the small man's chance to be in on the ground floor of a 'big company' play. Write us for full details.

ACACIA OIL & ROYALTY CO.
1365 East 52nd Place,
Tulsa, Oklahoma

RESORTS

RANCH LIFE in at TEXAS

Outstanding Dude Ranch - scenic hill country - deluxe cottages - swimming pool - riding - hunting - fishing - sports. Modern Airport, complete aviation service.

Write for folder, rates. **Flying L Ranch** BANDERA, TEXAS

EQUIPMENT MEN

(Continued from page 182)

Allen Joins Strata-Crete

R. M. Cook, vice president in charge of Strata-Crete Sales, Great Lakes Corp., has announced that George M. Allen, formerly Rocky Mountain manager for Security Engineering Co., Inc., is now with Strata-Crete Sales as Rocky Mountain district manager.

Oilfield Tank Manufacturers Hold First Annual Meeting

The Oilfield Tank Manufacturers' Association held its first annual meeting at the Mayo Hotel in Tulsa February 20, according to E. H. Zachariae, executive secretary.

New officers for 1952 are: president, A. Sidney Knowles, president of Parkersburg Rig & Reel Co.; vice president, C. G. Wells, vice president of National Tank Co.; treasurer, Avery Mitchell, president of M & V Tank Co.; and executive secretary, Zachariae.

Guest speaker at the meeting was, Tom Collins, City National Bank & Trust Co. of Kansas City, Mo., who related problems of the tank manufacturer to current business trends. In addition to the general meeting held in the evening, each of the standing committees held discussions throughout the day.

Membership of the association is made up of representatixes of: Baker Tank Co.; Black, Sivalls & Bryson, Inc.; Burcamp Steel Co.; Butler Manufacturing Co.; Columbian Steel Tank Co.; Continental Tank Co.; J & L Steel & Supply Co.; Lincoln Tank Co.; Maloney-Crawford Tank & Manufacturing Co.; McNamar & Crowley, Inc.; Modern Welding Co.; Murdock Tank & Manufacturing Co.; M & V Tank Co.; National Tank Co.; Odessa Valve & Machine Co.; Panhandle Steel Products Co.; Parkersburg Rig & Reel Co.; Peerless Manufacturing Co.; R & R Tank & Supply Co.; O'Neill Tank Co.; Sivalls Tanks, Inc.; Tyson Smith Co.; and Union Tank & Supply Co.

Officers for 1952 seated at the head table during the recent meeting of Oilfield Tank Manufacturers Association are: C. G. Wells, vice president; Avery Mitchell, treasurer; Tom Collins, guest speaker; K. W. Lineberry, executive committee member; A. Sidney Knowles, president; E. H. Zachariae, executive secretary; and J. P. Walker, adviser. E. Lloyd Byer, president, Union Tank & Supply Co., an executive committee member of the association, was not present for the picture.

ADVERTISERS

Acme Fishing Tool Co. 158
Allen Foundry & Machine Works 159
American Cable Division of American Chain & Cable Co., Inc. Inside Back Cover
American Iron & Machine Works Co. 105
American Optical Company 39
B and W, Incorporated 167
Baird Mfg. Co. 161
Baker Oil Tools, Inc. 60
Baroid Sales Division, National Lead Company 8
Beaumont Iron Works Co. 32
Bethlehem Steel Co. 43
Black, Sivalls & Bryson, Inc. 52, 53
Boyles Galvanizing Company 180
Broderick & Bascom Rope Co. Front Cover
Buda Co., The 27
Byron Jackson Co. 48
Cameron Iron Works, Inc. 110, 111
Chemical & Geological Laboratories 54
Chicago Bridge & Iron Company 75
Chrysler Corporation, Industrial Engine Division 42
Clark Bros. Co., Inc. 98, 99
Classified Advertising 183, 184, 185, 186
Cleaner Pipelines Co. 147
Cleveland Trencher Company, The 48
Columbia Gas System, The 44
Continental Oil Co. 11
Cooper, Inc., Fred E. 119
Crose Manufacturing Co., Inc., M. J. 148
Cummins Engine Co., Inc. 29
Dean Brothers Pumps, Inc. 146
Dowell Incorporated 93
Drilling & Service, Inc. 171
Drilling Specialties Co. 58
du Pont 1
Edwards Wire Rope 47
Emsco Derrick & Equipment Co. 30, 31
Fairbanks, Morse & Co. 2
Fluor Corporation, Ltd., The 150
Ford Motor Company 33
Foster Cathead Company 164
Fulton & Company, R. H. 134
Gardner-Denver Company 21
Gates Rubber Co., The 16
General American Transportation Corporation 56
Gill Co., J. B. 151
Globe Oil Tools Company 154
Goulds Pumps, Inc. 153
Grancell, I. H. 165
Grant Oil Tool Co. 172
Guiberson Corporation 143
H & M Pipe Beveling Machine Co. 146
Halliburton Oil Well Cementing Co. 10
Hallicrafters 14
Houston Contracting Company 136
Huey & Co., S. E. 137
Hughes Tool Co. Back Cover
Humble Oil & Refining Co. 22
Inferno Co., The 151, 152
International Harvester Co. 101
Jarecki International Supply Division, H. K. Porter Company, Inc. 18
Jones & Laughlin Supply Co. 24
Justrite Manufacturing Co. 157
Kelley Company, Ben F. 160
Kinney, Inc. 173
Koehler & Gunther, Inc. 175
Koppers Company, Inc. 28
Lane-Wells Company 114
Larkin Packer Company, Inc. 170
LeBus International Engineers, Limited 40
Leeds & Northrup Co. 23
Link-Belt Company 5
Macwhyte Co. 3
Magnet Cove Barium Corp. 162
Manning, Maxwell & Moore, Inc. 20
Marley Company, Inc., The 7
Marman Products Co., Inc. 146
Martin, John M. 157
McEvoy Company 38
McKee & Co., Arthur G. 132
McKissick Products Corporation 124
Minneapolis-Honeywell Regulator Co., Industrial Division 13
Mission Mfg. Company 122
Moon Brothers, Ltd. 149
Moore Corporation, Lee C. 169
Murdock Tank & Mfg. Co. 133
National Airoil Burner Co., The 133
National Bank of Tulsa 12
Nicholson & Co., W. H. 132
Nordstrom Valve Division, Rockwell Manufacturing Company Inside Front Cover
Oil and Gas Journal, The 137
Oil Center Tool Co. 8
Outboard Marine & Mfg. Co. 117
Paris Distributor, Inc., Henry H. 137
Parkersburg Rig & Reel Co. 55
Pelton Water Wheel Co. 94
Perrault Brothers 147, 181
Petroleum Distributing Co. 156
Pipeline Cleaners Co. 127
Pipe Line Service Corp. 49
Pipe Linings, Inc. 176
Rector Well Equipment Co., Inc. 135
Reda Pump Company 34
Reed Roller Bit Company 107
Regan Forge & Engineering Co. 131
Republic Rubber Division of Lee Rubber & Tire Corp. 41
Republic Steel Corporation 25
Rockford Clutch Division of Borg-Warner Company 166
Rockwell Manufacturing Company 37
Rolo Manufacturing Co. 131
Ross-Martin Co. 183
Schield Bantam Company 139
Schlumberger Well Surveying Corp. 17
Security Engineering Co., Inc. 127
Shamrock Hotel, The 149
Snap-On Tools Corporation 51
Socony-Vacuum Oil Co., Inc. 19
Standco Brake Lining Co. 156
Stewart & Stevenson Service, Inc. 113
Taylor Forge & Pipe Works 140
Texas Company, The 36
Thomas Flexible Coupling Co. 169
Thornhill-Craver Co. 128
Timken Roller Bearing Company 45
Tripplehorn Co., The 168
Trojan Construction Co., Inc. 136
Unit Rig & Equipment Co. 34, 35
United Supply & Manufacturing Co. 50
Vernon Tool Co., Ltd. 163
Victor Products Corp. 152
Viking Pump Co. 169
Visco Products Co., Inc. 77
Walker Company, W. L. 135
Waukesha Sales & Service, Inc. 4
Web Wilson Oil Tools 155
Well Equipment Mfg. Corp. 122
Wheland Company, The 38
Wickes Boiler Co., The 138
Williamson, Inc., T. D. 188
Wilson Manufacturing Co., Inc. 15
Worthington Pump & Machinery Corp. 9
Wright Chemical Corporation 174
Yale Machine Works 153

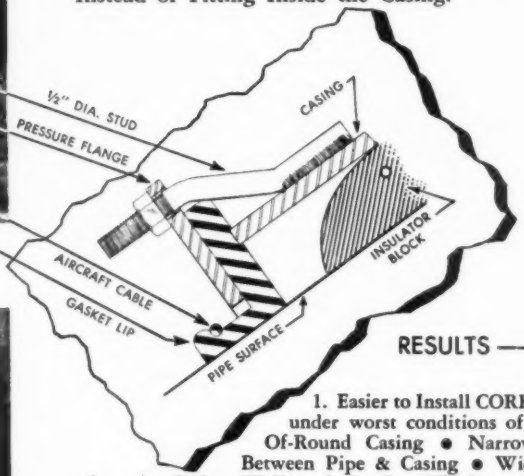
TABLE OF CONTENTS ON PAGE 59

PIPE-LINE TESTED, PROVED and ACCEPTED in '51

Assembling cable with rubber-covered union for clamping gasket lip to pipe.

TYPE "L" WmSEAL CASING BUSHING*

A New Design: It BUTTS Against End of Casing Instead of Fitting Inside the Casing.



THE COMPLETED INSTALLATION
Note that galvanized cable and union are insulated from pressure flange and from pipe.

RESULTS —

1. Easier to Install CORRECTLY under worst conditions of • Out-Of-Round Casing • Narrow Space Between Pipe & Casing • Wide Variations in Casing Wall and Coating Thickness • Mud • Casing ends beveled — by machine or hand torch.
2. WATER-TIGHT Seal with "L" gasket . . . . . .
   - BUTTED AGAINST CASING as pressure flange is tightened on ½" studs welded to casing.
   - TIGHT TO THE PIPE as aircraft cable (4,600# tensile) is tightened to gasket lip. Union is rubber covered to INSULATE galvanized cable assembly from bare casing structure.
3. Always Insulated from the pipe line when a Concentric-Support Insulator is installed just inside casing after the "drag section" is in place.

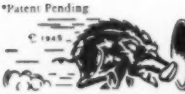
AS STRONG & DEPENDABLE AS THE MEN WHO INSTALL THEM

REPRESENTATIVES

Stuart Steel Protection Corp. Kenilworth, New Jersey | H. E. Davis Los Angeles 15, Calif. | James S. Kone Co. Amarillo, Texas | Keyes Tank Co. Provo, Utah | Keyes Tank & Supply Co. Casper, Wyoming | Canadian Equipment Sales & Service Co., Ltd. Edmonton, Calgary, Toronto, Canada

WRITE FOR COMPLETE INFORMATION

*Patent Pending



THE PIG WITH THE POKE CLEANS PIPE LINES

T. D. Williamson, Inc.
TULSA 9, OKLAHOMA

The BEST Line for Rotary Drilling ...TRU-LAY Preformed

● For each use there is *one best* wire rope . . . one that will stand repeated loading, abrasion, crushing, or continuous bending, and be the best to buy.

To achieve this, there is a TRU-LAY Preformed Wire Rope made in 6x19 Seale, improved plow steel with steel core for your equipment. This construction has the exactly right combination of strength, bending life, and resistance to wear and crushing that you need.

The one best drilling line . . . TRU-LAY Preformed . . . will last you longer and cost less to use. Specify and get TRU-LAY Preformed.

Write for folder DH-209.

ACCO

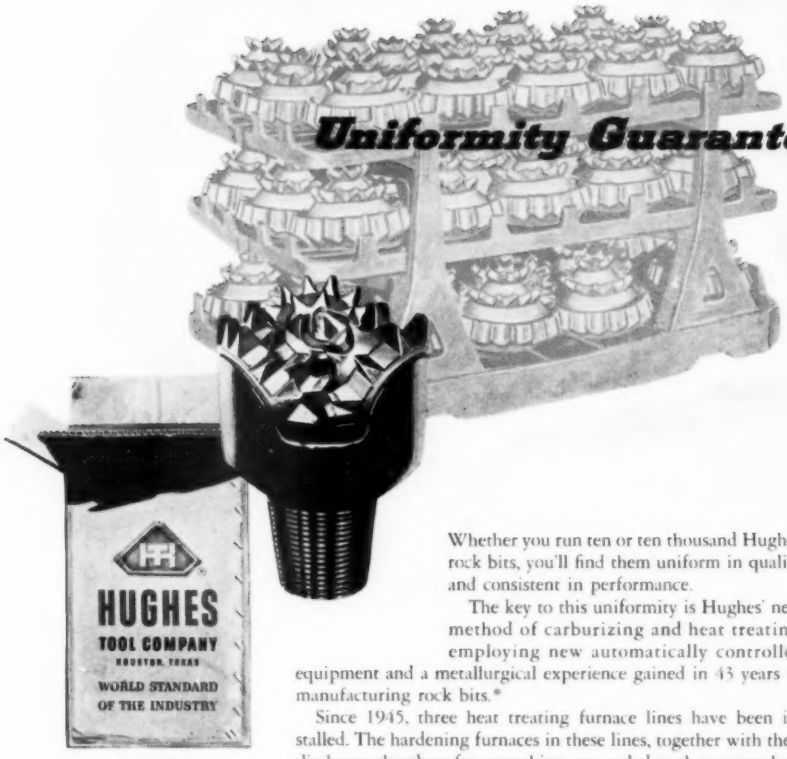
TRADE MARK

AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

Makers of Registered WIRE ROPE SLINGS

Uniformity Guaranteed!



HUGHES Tri-Cone® ROCK BITS

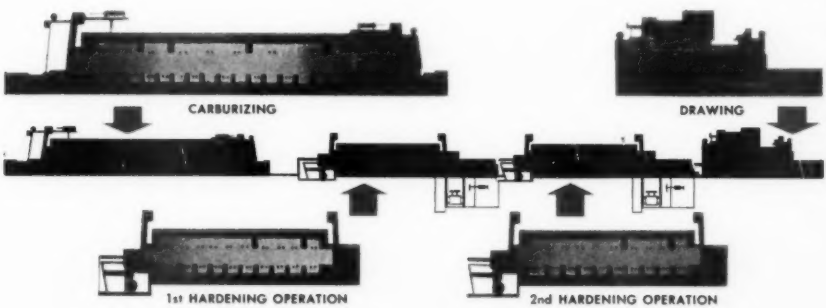
Whether you run ten or ten thousand Hughes rock bits, you'll find them uniform in quality and consistent in performance.

The key to this uniformity is Hughes' new method of carburizing and heat treating, employing new automatically controlled equipment and a metallurgical experience gained in 43 years of manufacturing rock bits.*

Since 1945, three heat treating furnace lines have been installed. The hardening furnaces in these lines, together with their discharge chambers for quenching, are sealed so that atmosphere as well as temperatures can be controlled.

These new furnace lines permit the desired level of carburization to be set and maintained without variance. The metallurgical characteristics of the case best suited to each size and type of bit is thus assured.

Heat treating—the refining, hardening and drawing of the steel—is done in three stages, each a continuous, automatic operation, in which every step is time-controlled.

Carburizing and heat treating as now done by Hughes, with the latest, most modern equipment available, is your guarantee that the rock bits you get will give the uniform, dependable performance for which they are designed.

*Hughes Tool Company is the largest deep case carburizer of manufactured products in the world.